Vol. 923 Number 2

OFFICIAL GAZETTE

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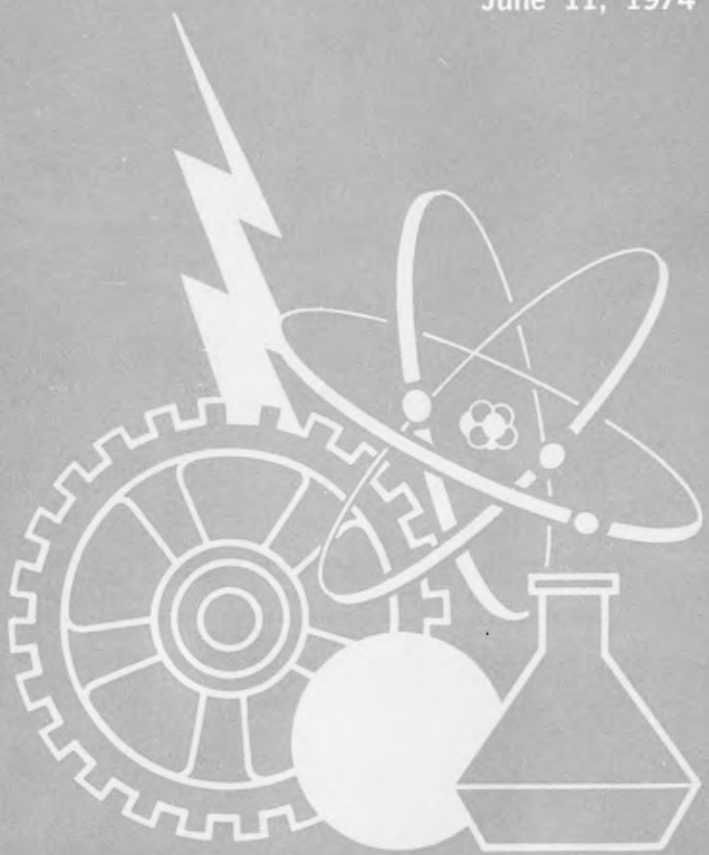
PATENTS

June 11, 1974



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 11, 1974 Volume 923 Number 2

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PATENT OFFICE NOTICES

Availability of U.S. Patent Classification Microfilm

The Patent Office announces the availability of its microfilm publication, "U.S. Patent Classification—Subclass Listing" (Patent Office Publication PAT-002.1–7312–M), which is offered for sale through the National Technical Information Service (NTIS).

This microfilm presents in sequence by the classes and subclasses of the official U.S. Classification, the patent numbers of the U.S. patents which are classified as "originals" and as "cross-references" in each of the subclasses. Within each subclass, the patent numbers are listed in numerical sequence. A symbol appears in conjunction with patent numbers to denote those patents which are cross-reference classified in a subclass.

All U.S. patents issued through December 1973 (patent number 3,781,913 and reissue patent number 27,855) are included in this publication. It supersedes the microfilm listing, "Cumulative Index to the Classification of Patents," dated February 1969.

The entire publication consists of 7 reels of 16mm negative microfilm which is priced at $30 in plain reels and at $44 in cartridges. A choice of 3M or Recordak cartridges or "Thread Easy" magazines is offered. Individual reels may be purchased at $6 in plain reel or $8 in cartridge form.

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3	COM-74-10743-*	107–165	
4	COM-74-10744-*	166–220	
5	COM-74-10745-*	222–260	(to subclass 501.15)
6	COM-74-10746-*	260–317	(remainder of 260)
7	COM-74-10746-*	318–444	

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WILLIAM I. MERKIN,
May 17, 1974 *Assistant Commissioner for Administration.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,757,940, J. Moss, BUSINESS FORMS; **2,980,446,** same, BUSINESS FORM ASSEMBLY, **filed** Aug. 28, 1973, D.C., S.D. Ohio (Columbus), Doc. 4510, *Allied/Egry Business Systems, Inc.* v. *Moss Key-Rec Systems, Inc.*

2,790,516, Wright and Butler, VEHICLE DISC BRAKE ASSEMBLY; **2,921,650,** H. J. Butler, DISC BRAKE, **filed** Aug. 24, 1973, D.C., E.D. Mich. (Detroit), Doc. 72–1892–93, *The Dunlop Company, Limited* v. *Kelsey-Hayes Company.* Patent 2,790,516 invalid and has not been infringed, Patent 2,921,650 is valid, and has not been infringed, affirmed Aug. 24, 1973.

2,800,440, H. Brown, ELECTRODEPOSITION OF NICKEL; **2,841,602,** Brown, Becking and Tomaszewski, ALKYNOXY ACIDS, **filed** Apr. 10, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c895, *Oxy Metal Finishing Corp.* v. *Chemetron Corp.* Parties agree to order cause stricken with prejudice with leave to reinstate on motion of either party, Mar. 2, 1973; order cause dismissed without prejudice, June 12, 1973.

2,807,016, P.F.M. Gloess, SOUNDING DEVICE USING ELECTROMAGNETIC WAVES, **filed** Aug. 14, 1973, Ct. of Claims (District of Columbia), Doc. 263–73, *International Telephone and Telegraph Corporation and International Standard Electric Corporation* v. *The United States.*

2,824,011, B. E. Williams, METHOD OF CLOTHING MEAT, **filed** July 17, 1973, D.C., N.D. Tex. (Amarillo), Doc. CA–2–1426, *Bemis Company, Inc. and Beverly E. Williams* v. *Phil Hantover Inc.*

2,835,319, M. J. Fleming, Jr., INFLATABLE SELF CONTRACTING TIRE BEAD SEATING DEVICE; **2,844,126,** R. H. Gaylord, FLUID ACTUATED MOTOR SYSTEM AND STROKING DEVICE, **filed** Oct. 7, 1969, D.C.N.J. (Trenton), Doc. 1180–69, *Gould, Inc.* v. *Tool Aid Manufacturing Co., Inc.; Meyer Iglewitz and Rita Iglewitz.* Consent judgment for permanent injunction; patents of plaintiff valid and infringed, Feb. 15, 1973.

2,841,602. (See 2,800,440.)

2,844,126. (See 2,835,319.)

2,921,650. (See 2,790,516.)

2,980,446. (See 2,757,940.)

2,988,849, M. P. Laughlin, MEANS FOR APPLYING PLANT GROWTH CONTROL CHEMICALS, **filed** Aug .13, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2073, *Discovery Rights, Inc.* v. *Avon Products, Inc.*

3,011,213, Brandon, Jr. and Eyberger, APPARATUS FOR LUBRICATING MOLD CAVITIES; **3,063,098,** H. Eyberger, PRESSURE FORMING APPARATUS; **3,244,782,** same, TOROIDAL CORE PRESSURE FORMING METHOD; **Re. 25,-441,** same, PRESSURE FORMING APPARATUS, **filed** Apr. 19, 1967, D.C., N.D. Ill. (Chicago), Doc. 67c635, *Magnetics, Inc.* v. *The Arnold Engineering Company.* Decision: Filed mandate from U.S.C.A., order judgment of U.S.D.C. affirmed, petition for rehearing was denied, Mar. 16, 1971.

3,021,871, F. J. Rodgers, HOSE FOR PORTABLE PNEUMATIC EQUIPMENT, **filed** Aug. 29, 1973, D.C.N.J. (Newark), Doc. C–1254–73, *Coilhose Pneumatics* v. *Samuel Moore & Company et al.*

3,063,098. (See 3,011,213.)

3,143,230, C. R. Golinick, REFUSE VEHICLE, **filed** June 22, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C307, *Leach Company* v. *The Heil Co.* Stipulation and order of dismissal, Aug. 13, 1973.

3,238,309, O. Christoffersen, HEARING AID APPARATUSES, **filed** Aug. 16, 1973, D.C. Conn. (New Haven), Doc. 15831, *Kendeane, Inc.* v. *Acousticon Systems Corporation.*

3,244,782. (See 3,011,213.)

3,259,349, E. R. Lee, REAR VIEW MIRROR; **3,372,897,** same, **filed** June 6, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1455, *S. H. Leggitt Company, Incorporated* v. *King of the Road Mirrors, Inc. and William A. Panozzo.* Filed plaintiff's Notice of Dismissal of Action, Aug. 8, 1973.

3,309,256, R. Warsager, APPARATUS FOR SURFACE DECORATING OF ARTICLES, **filed** June 2, 1970, D.C.N.J. (Newark), Doc. 706–70, *Rubin Warsager* v. *Dri-Print Foils, Inc.* Dismissal of complaint and counterclaims, Aug. 20, 1973.

3,372,897. (See 3,259,349.)

3,379,228, G. A. Carlberg, PORTABLE SAW TABLE; **3,379,-229,** B. L. Siegal, same, **filed** July 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1875, *Porta-Table Corporation* v. *Kaiser Aluminum and Chemical Sales, Inc.* Stipulation, order cause dismissed with prejudice, May 3, 1972.

3,379,229. (See 3,379,228.)

3,680,649. (See 3,460,641.)

3,460,641, A. A. Johnson, FLUENT MATERIAL WEIGHING SYSTEM; **3,680,649,** same, **filed** Aug. 24, 1973, D.C., M.D. Tenn. (Nashville), Doc. C–887, *Allie A. Johnson* v. *Roy B. Arney, Beulah Mai Arney and Helen Scales Trice.*

3,479,030, A. Merola, HOLLOW, METAL BALL BAT, **filed** Aug. 15, 1973, D.C., W.D. Pa. (Pittsburgh), Doc. 73–0698, *Aluminum Company of America and Alcoa Sport Products Co.* v. *Amerola Products Corporation.*

3,496,911, A. Chmelar, ELECTROSTATIC FLOCKING, **filed** Feb. 16, 1972, D.C., N.D. Ga. (Atlanta), Doc. C.A. 16204, *Velvetex Industrial Corporation* v. *Evershine Products, Inc.* Dismissed without prejudice by parties, Aug. 14, 1973.

3,530,583, Klein and Anderson, TRACTIVE MEANS FOR USE WITH ORTHODONTIC APPARATUS, **filed** Aug. 29, 1973, D.C., N.D. Tex. (Dallas), Doc. CA–3–7599–E, *Modcom, Inc.* v. *Ormco Corporation.*

3,548,066, A. B. Freeman, PLURAL MODE AUTOMATIC BASS NOTE SYSTEM FOR MUSICAL CHORDS WITH AUTOMATIC RHYTHM DEVICE; **3,711,618,** same, AUTOMATIC HARMONY APPARATUS, **filed** July 27, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1909, *Alfred B. Freeman* v. *Chicago Musical Instrument Co.*

3,567,029, B. A. Quame, COLUMN FOR TESTING BIOLOGICAL FLUIDS, **filed** Aug. 21, 1973, D.C., E.D.N.Y. (Brooklyn), Doc. 73C1256, *Babington A. Quame* v. *Bio-Rad Laboratories.*

3,575,678, W. F. Barton, REED SWITCH ASSEMBLY, **filed** Aug. 9, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2033, *Grigsby Barton, Inc.* v. *M. John Petersen, doing business as M. J. Petersen & Associates.* **Same, filed** Aug. 9, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2034, *Grigsby Barton, Inc.* v. *Lincoln, Hodges & Associates Inc.*

3,610,815, Gould, Lieberman and Belmares-Sarabia, MOTION PICTURE FILM COLOR CORRECTION SYSTEM AND METHOD, **filed** Oct. 27, 1971, D.C., S.D.N.Y., Doc. 71–C–4680, *Telectronics International Inc.* v. *Columbia Pictures Industries, Inc.* Filed stipulation and order of dismissal with prejudice to renewal, July 31, 1973.

3,628,790, D. W. Gordon, GYMNAST TRAINER CUSHIONS, **filed** Aug. 16, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1916–DWW, *Ampro Corporation* v. *Centurion Products and Steven B. Ripley, etc.*

3,634,891, J. M. Kemper, SELF-CONTAINED RECIRCULATING SANITARY SYSTEM; **3,662,888,** same, RECIRCULATING TOILET SYSTEM AND FILTER THEREFOR, **filed** Aug. 11, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1857–MML, *Monogram, Industries* v. *Sanco Systems International and Jade Fabrication Inc.* Filed judgment and order permanently enjoining defendants from infringing plaintiff's patents, complaints dismissed without prejudice and counterclaim of defendant, Sanco Systems International, dismissed without prejudice, July 31, 1973.

3,642,531, R. L. Peterson, WATER BASED FIRE PROTECTIVE COMPOSITION APPLIED TO ELECTRICAL CABLE, **filed** Aug. 20, 1973, D.C.S.C. (Columbia), Doc. C/A 73–920, *The Dyna-Therm Corporation* v. *The South Carolina Electric and Gas Company.*

3,648,338, W. F. Mruk, AUTOMATIC TENSION CONTROL APPARATUS, **filed** Aug. 14, 1973, D.C. Conn. (Bridgeport), Doc. B–836, *MDC Corporation* v. *Allied Control Company, Inc.*

3,662,888. (See 3,634,891.)

3,711,618. (See 3,548,066.)

Re. 25,441. (See 3,011,213.)

D. 219,118, Baker and Plecia, BOAT, **filed** Aug. 3, 1973, D.C., M.D.N.C. (Greensboro), Doc. C–145–G–73, *Sidewinder Marine, Inc.* v. *A. Bert Crocker and Eddie L. Snow, individually and doing business as Riverboats Marine.*

Certificates of Correction for the Week of June 11, 1974

D. 228,757	3,761,605	3,779,760	3,788,643
D. 229,018	3,763,629	3,780,571	3,788,744
3,546,524	3,763,914	3,781,108	3,788,783
3,570,491	3,764,277	3,781,303	3,788,853
3,601,713	3,765,533	3,782,091	3,788,860
3,645,858	3,767,436	3,782,174	3,788,966
3,659,020	3,767,583	3,782,209	3,789,012
3,660,989	3,767,653	3,782,898	3,789,130
3,672,808	3,768,078	3,782,967	3,789,165
3,673,558	3,768,097	3,783,006	3,789,178
3,679,804	3,769,268	3,783,087	3,789,524
3,693,073	3,770,775	3,783,247	3,789,957
3,697,141	3,771,557	3,783,384	3,790,280
3,706,992	3,771,676	3,783,464	3,791,245
3,715,348	3,771,985	3,783,686	3,791,340
3,715,710	3,772,094	3,783,762	3,791,584
3,718,645	3,772,624	3,783,870	3,791,664
3,720,888	3,773,474	3,783,897	3,791,848
3,724,376	3,773,652	3,784,190	3,791,940
3,727,686	3,774,297	3,784,284	3,791,960
3,728,514	3,774,700	3,784,356	3,791,975
3,739,187	3,774,880	3,784,819	3,792,170
3,739,510	3,775,270	3,784,928	3,792,459
3,742,597	3,775,667	3,785,560	3,792,619
3,748,611	3,775,736	3,785,712	3,792,643
3,749,786	3,775,830	3,785,776	3,792,741
3,750,921	3,776,989	3,786,354	3,793,044
3,751,382	3,777,050	3,786,437	3,793,182
3,751,734	3,777,202	3,786,762	3,793,486
3,754,354	3,777,602	3,787,115	3,793,525
3,755,238	3,777,780	3,787,401	3,793,733
3,755,301	3,777,890	3,787,753	3,793,797
3,757,219	3,778,338	3,787,980	3,793,911
3,757,920	3,778,626	3,788,054	3,794,200
3,760,102	3,778,903	3,788,105	3,794,259
3,760,391	3,779,427	3,788,171	3,794,309
3,760,419	3,779,464	3,788,483	
3,761,374	3,779,655	3,788,552	

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the licensing policy of each agency-sponsor.

Copies of Patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each.

Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

DEPARTMENT OF THE AIR FORCE AF/JACP
Washington, D.C. 20314

Patent application 392,379. Low Spin-Deceleration Safing and Arming Mechanism. Filed Aug. 28, 1973. PC $4/MF $1.45.

Patent application 392,381. Non-Abradable Turbine Seal. Filed Aug. 28, 1973. PC $4/MF $1.45.

Patent application 394,891. Preparation of Yttrium and Lanthanide Hexafluoroisopropoxide Diammoniates. Filed Sept. 6, 1973. PC $4/MF $1.45.

Patent application 401,000. Thermally Stable Perfluoroalkylene Ether Bibenzoxazole Polymers. Filed Sept. 26, 1973. PC $4/MF $1.45.

Patent application 401,005. Digital Phase Measuring System. Filed Sept. 26, 1973. PC $4/MF $1.45.

Patent application 404,061. Electronic Antenna Tuning Technique. Filed Oct. 5, 1973. PC $4/MF $1.45.

Patent application 404,090. Composite Wall for a Regeneratively Cooled Thrust Chamber of a Liquid Propellant Rocket Engine. Filed Oct. 5, 1973. PC $4.25/MF $1.45.

Patent application 405,710. Ultra Low Diffraction Loss Substrate Members for Acoustic Surface Wave Devices. Filed Oct. 11, 1973. PC $4/MF $1.45.

U.S. DEPARTMENT OF AGRICULTURE
Chief, Research Agreements and Patent Mgmt. Branch Federal Building, General Services Division, Agricultural Research Service, Hyattsville, Md. 20782

Patent application 090,792. Esters of 1,4-Benzodioxan-2-Carboxylic Acid as Attractants for the European Chafer. Filed Aug. 1, 1973. PC $4/MF $1.45.

Patent application 328,204. Process for Curing Tobacco. Filed Jan. 31, 1973. PC $4/MF $1.45.

Patent application 348,803. N-Substituted Fatty Acid Amide Lubricants. Filed Apr. 6, 1973. PC $4.25/MF $1.45.

Patent application 456,911. Highly Absorbent Starch-Containing Polymeric Compositions. Filed Mar. 3, 1974. PC $6/MF $1.45.

Patent 3,692,532. Milk-Fruit Juice Beverage and Process for Preparing Same. Filed Oct. 27, 1970. Patented Sept. 19, 1972. Not available NTIS.

Patent 3,701,609. Apparatus for Automatically Adding Preselected Patterns of Eluent Solutions to a Chromatographic Column and Monitoring and Collecting Eluted Fractions. Filed May 13, 1971. Patented Oct. 31, 1972. Not available NTIS.

Patent 3,701,802. Cyanoethylation of Hydroxy Compounds. Filed Aug. 22, 1969. Patented Oct. 31, 1972. Not available NTIS.

Patent 3,702,358. Cis-1-Hexadecen-1-ol Acetate as an Attractant for Adult Male Pink Bollworm Moths. Filed Dec. 2, 1970. Patented Nov. 7, 1972. Not available NTIS.

Patent 3,719,449. Crosslinked Heterocyclic Cellulosic Products. Filed Apr. 27, 1972. Patented Mar. 6, 1973. Not available NTIS.

Patent 3,723,058. Removal of Free Formaldehyde from Solutions of Methylolated Carbamate Finishing Agents and Textiles Treated Therewith. Filed Apr. 27, 1972. Patented Mar. 27, 1973. Not available NTIS.

Patent 3,725,551. Insect Control Process with Synthetic Hormones. Filed Nov. 10, 1970. Patented Apr. 3, 1973. Not available NTIS.

Patent 3,743,719. Mixtures of Cyclohexanealkanoic Acids, Their Esters and Eugenol as Attractants for the Japanese Beetle. Filed Nov. 18, 1970. Patented July 3, 1973. Not available NTIS.

Patent 3,745,181. Process for the Preparation of Surfactants. Filed June 28, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,746,767. Mothproofing Wool. Filed June 7, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,748,149. Continuous Production of Cheese Curd. Filed Feb. 14, 1972. Patented July 24, 1973. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 300 7th St. SW.,
Washington, D.C. 20590

Patent application 462,618. Radioisotope Gauge for Determining Cement Content of Concrete. Filed Apr. 22, 1974. PC $4/MF $1.45.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 436,315. Duplex Aluminized Coatings. Filed Jan. 24, 1974. PC $4/MF $1.45.

Patent application 440,917. Axially and Radially Controllable Magnetic Bearing. Filed Feb. 8, 1974. PC $4.25/MF $1.45.

Patent application 445,178. Journal Bearings. Filed Feb. 25, 1973. PC $4/MF $1.45.

Patent application 445,398. Testing Device Using X-Ray Lasers. Filed Feb. 25, 1974. PC $4/MF $1.45.

Patent application 446,568. Method of Making an Apertured Casting. Filed Feb. 27, 1974. PC $4/MF $1.45.

Patent application 448,325. Apparatus for Calibrating an Image Dissector Tube. Filed Mar. 5, 1974. PC $4/MF $1.45.

Patent application 449,153. An Improved Heat Sterilizable Patient Ventilator. Filed Mar. 7, 1974. PC $4.25/MF $1.45.

Patent application 450,505. Drilled Ball Bearing with a One Piece Anti-Tipping Cage Assembly. Filed Mar. 12, 1974. PC $4/MF $1.45.

Patent application 450,536. Electrostatic Entrained Material Measurement System. Filed Mar. 12, 1974. PC $4/MF $1.45.

Patent 3,763,708. Cryogenic Gyroscope Housing. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,787,959. Diffusion Welding in Air. Patented Jan. 29, 1974. Not available NTIS.

Patent 3,788,163. Manual Actuator. Patented Jan. 29, 1974. Not available NTIS.

Patent 3,789,654. Method for Determining Thermo-Physical Properties of Specimens. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,790,037. Metering Gun for Dispensing Precisely Measured Charges of Fluid. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,790,347. Apparatus for Remote Handling of Materials. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,790,650. Method for Compression Molding of Thermosetting Plastics Utilizing a Temperature Gradient Across the Plastic to Cure the Article. Patented Feb. 5, 1974. Not available NTIS.

Patent 3,791,207. Wind Tunnel Model and Method. Patented Feb. 12, 1974. Not available NTIS.

Patents Available for Licensing or Sale

3,237,885. SPACE CRAFT. Jack L. Mohar, 41 W. Arbor St., Long Beach, Calif., 90805.

3,347,998. TELEPHONE HANDSET HOLDER. Zed Cunningham, 4101 Green Court, Cleveland, Ohio, 44104.

3,474,799. TOOTH SPACE CLEANER USING DENTAL FLOSS LINKS ON HOLDER. Vito P. Cappello, 1047 Franklin St., Santa Monica, Calif., 90403.

3,608,422. FRONT LOADING FIRING APPARATUS. R. Bretnor, P.O. Box 748, Jacksonville, Oreg., 97530.

3,704,910. ADJUSTABLE TORSO SUPPORT ATTACHMENT FOR WHEELCHAIRS AND THE LIKE. Walter F. Willcott, RR #2, Staff Housing #2, Carterville, Ill., 62918.

3,727,118. CONTACTLESS REVERSIBLE DEVICE IN AN ELECTRIC CAR. Nippon Gijutsu Boeki Co., Ltd., 32F Kasumigaseki Bldg., 2-5 Kasumigaseki, 3-chome, Chiyoda-ku, Tokyo 100, Japan.

3,738,585. CHOPPER FOR MEAT AND OTHER FOODS. Abram Berland et al. Correspondence to: Woodhams, Blanchard and Flynn, 2026 Rambling Road, Kalamazoo, Mich., 49008.

3,740,038. ENVIRONMENTAL BOARD GAME APPARATUS. Ronald Feulner, P.O. Box 317, Palatine Bridge, N.Y., 13428.

3,763,817. TOW-CRAFT FOR SWIMMER. Alphons Francis. Correspondence to: John M. Fish, Jr., 219 Couch Drive, Oklahoma City, Okla., 73102.

3,765,350. SEWING MACHINE CONVERSION ASSEMBLY. Charles Sztarl, P.O. Box 204, Allentown, Pa. 18105.

3,771,900. GRADUATED SCREW PUMP. Samuel J. Baehr, La Prairie, Ill., 62346.

3,782,927. MATERIAL FOR DIRECT THERMOELECTRIC ENERGY CONVERSION WITH A HIGH FIGURE OF MERIT. Michael C. Nicolaou, Apartado Aereo 1644, Bucaramanga, Colombia, S.A.

3,794,589. CHEMICAL COMPOSITIONS FOR GENERAL CLEANING. Adolph Fishman, 940 Oak Ave., St. Lambert, Quebec, Canada, J4P 1Z7.

3,795,026. SAW-TOOTHED SCRAPER. Francis J. and Kenneth J. Kazamek. 11696 Lafayette Drive, Parma Heights, Ohio, 44130.

3,794,013. PORTABLE GAS GRILL. Orville C. Upton, 7421 Vandenberg Drive, Sacramento, Calif., 95820.

3,798,937. TIME LOCK CIGARETTE CASE. Gerald R. Sysk, 2873 Botany Drive, Jonesboro, Ga., 30236.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 6 patents upon reasonable terms.

Applications for license may be addressed to: The Director, Patent Section, General Motors Building, 3044 West Grand Blvd., Detroit, Mich., 48202.

3,603,599. COOLED SEAL.

3,606,572. AIRFOIL WITH POROUS LEADING EDGE.

3,606,573. POROUS LAMINATE.

3,607,152. SILVER BRAZED TITANIUM COMPOSITE.

3,610,769. POROUS FACING ATTACHMENT.

3,611,725. LIFT-CRUISE JET ENGINE.

RCA Corporation offers to grant non-exclusive licenses under the following 27 patents on reasonable terms and conditions.

Inquiries respecting license under the following patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

Re. 27,835. LSI ARRAY AND STANDARD CELLS.

3,795,433. VOLTAGE INDUCED OPTICAL WAVEGUIDE MEANS.

3,795,534. MANUFACTURE OF VIDEO DISCS.

3,795,762. PLURAL OPERATING MODE TELEVISION RECEIVERS.

3,795,767. HIGH VOLTAGE PROTECTION CIRCUIT.

3,795,823. SIGNAL DETECTION IN NOISY TRANSMISSION PATH.

3,796,831. PULSE MODULATION AND DETECTION COMMUNICATIONS SYSTEM.

3,796,863. OPTICAL SCANNING ARRANGEMENT AND ARTICLE USEFUL THEREWITH.

3,796,866. AUTOMATIC GAIN CONTROL CIRCUIT.

3,796,919. POWER SUPPLY OVER VOLTAGE PROTECTION SYSTEM.

3,796,963. SIGNAL LIMITER FOR EXALTED CARRIER AM DETECTOR.

3,796,967. AMPLIFIER PROTECTION CIRCUIT.

3,798,059. THICK FILM INDUCTOR WITH FERROMAGNETIC CORE.

3,798,376. MULTIPLEX DECODING SYSTEM.

3,798,486. METAL VAPOR LASER DISCHARGE DEVICE.

3,798,552. AUTOMATIC FREQUENCY CONTROL FOR PULSE RADAR AND COMMUNICATION SYSTEMS.

3,798,575. MICROWAVE TRANSMISSION LINE AND DEVICES USING MULTIPLE COPLANAR CONDUCTORS.

3,798,615. COMPUTER SYSTEM WITH PROGRAM-CONTROLLED PROGRAM COUNTERS.

3,798,620. PAGE COMPOSER TRANSLATING INFORMATION FROM ELECTRICAL TO OPTICAL FORM.

3,798,746. PROCESS OF MAKING ACOUSTO-OPTIC DEVICES.

3,798,539. CARD STACKER HAVING ROTATABLE BUMPER TO STOP CARD TRAVEL.

3,798,642. HOLOGRAPHIC RECORDING ON PHOTOCHROMIC LITHIUM NIOBATE.

3,798,881. CATHODOCHROMIC CATHODE RAY TUBE AND METHOD FOR PREPARING CATHODOCHROMIC SODALITE FOR SAID TUBE.

3,800,130. FAST FOURIER TRANSFORM STAGE USING FLOATING POINT NUMBERS.

3,800,176. SELF-CONVERGING COLOR IMAGE DISPLAY SYSTEM.

3,800,178. MULTI-INDICIA DISPLAY DEVICE.

3,800,231. DOPPLER TRACKER RECEIVER.

General Electric Company is prepared to grant non-exclusive licenses under the following 63 patents upon reasonable terms to domestic manufacturers.

Applications for licenses under the following patent may be addressed to: Patent Counsel, General Electric Company, Box 237 G.P.O., Detroit, Mich., 48232.

3,742,654. ABRASIVE GRINDING WHEEL CONSTRUCTION.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, Switchgear Equip. Bus. Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,673,455. HIGH SPEED SENSOR FOR INITIATING CIRCUIT BREAKER TRIPPING.

3,646,292. HIGH-VOLTAGE ELECTRIC CIRCUIT BREAKER WITH HIGH-SPEED TRIPPING MEANS.

Applications for licenses under the following 3 patents may be addressed to: Patent Counsel, Gas Turbine Products Div., General Electric Company, 1 River Road, Bldg #500-2nd Floor, Schenectady, N.Y., 12345.

3,383,205. COBALT BASE ALLOYS.

3,766,734. DUEL FUEL CONTROL SYSTEM FOR A GAS TURBINE.

3,790,298. FLEXIBLE CONTOUR TURBINE NOZZLE FOR TIGHT CLOSURE.

Applications for license under the following 4 patents may be addressed to: General Electric Co., Division Patent Counsel, Housewares Business Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

3,142,012. BATTERY POWERED SYNCHRONOUS MOTOR.

3,214,662. ELECTRO-MECHANICAL FREQUENCY-DETERMINING SYSTEM.

3,432,698. ADJUSTABLE TORSION MEMBER MECHANISM FOR TORSION MEMBER CLOCKS.

3,678,499. ELECTRONIC DIGITAL CLOCK POWER FAILURE INDICATOR.

Applications for license under the following 5 patents may be addressed to: Patent Counsel, STG PRODS Div., General Electric Co., 1 River Road, Bldg. #43, Schenectady, N.Y., 12305.

3,739,208. REVERSE FLOW COOLING SYSTEM FOR A DYNAMOELECTRIC MACHINE.

3,739,213. COMPACT CONNECTION SYSTEM FOR POLYPHASE ARMATURE WINDINGS.

3,751,548. FORMED-IN-PLACE STATOR END WINDING BLOCKS FOR A DYNAMOELECTRIC MACHINE.

3,754,893. PURIFICATION OF STEEL.

3,755,702. FLOW-SURGE EQUIPMENT FOR DYNAMOELECTRIC MACHINE.

Applications for license under the following 10 patents may be addressed to: General Electric Co., Bldg. 43, Room 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

2,994,786. POWER FLOW CONTROL SYSTEM.

3,443,158. FAULT CURRENT RECORDER AND INDICATOR FOR ELECTRICAL CIRCUITS.

3,564,390. POWER CONVERTER CIRCUIT OPERATING AS AN ELECTRIC POTENTIAL TRANSFORMER.

3,600,784. SPRING-LOADED HOTSTOCK FOR MANIPULATING ELECTRIC CABLE CONNECTORS.

3,604,274. UNIFORM TORQUE ESCAPEMENT MECHANISM.

3,626,079. ELECTRICAL BUSHING WITH COOLING MEANS.

3,639,833. SOLID-STATE VOLTAGE AND FAULT DETECTOR MEANS HAVING INTEGRAL CIRCUIT INTEGRITY INDICATORS.

3,662,368. TELEMETERING SYSTEM HAVING A CONTINUOUSLY MONITORING ENCODER.

3,668,583. TECHNIQUES FOR CASTING ENCAPSULATED COILS.

3,675,175. HIGH VOLTAGE COIL ASSEMBLY FOR ELECTRIC INDUCTION APPARATUS.

Applications for licenses under the following 12 patents may be addressed to: General Electric Company, Division Patent Counsel, Housewares Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

2,873,908. FAN ARRANGEMENT FOR DOMESTIC APPLIANCES.

2,987,242. RESILIENT FAN GUARD SUPPORT.

3,084,852. FAN BLADE HUB CONNECTOR.

3,217,470. AIR PURIFIER CONSTRUCTION.

3,267,255. FORCED AIR ELECTRIC BASEBOARD HEATER.

3,385,516. FAN CONSTRUCTION.

3,399,911. HUB AND SHAFT COUPLING.

3,610,882. ELECTRIC SPACE HEATER.

3,624,351. SHOCK-PROOF ELECTRIC RADIANT HEATER.

3,625,633. CLUTCH ASSEMBLY FOR COUPLING MECHANISMS.

3,725,640. ELECTRIC FAN HEATER.

3,731,057. SENSING MEANS FOR ELECTRIC FAN HEATER.

Applications for licenses under the following 26 patents may be addressed to the Division Patent Counsel, Electronic Systems Division, General Electric Company, Bldg. 3, Room 216, Electronics Park, Syracuse, N.Y., 13201.

3,567,950. DRAWING-TO-TAPE PROGRAMMER WITH PHOTOELECTRIC SCAN POSITION ENCODING.

3,569,733. REVERSIBLE COUNTER CIRCUIT UTILIZING TUNNEL DIODES.

3,569,871. WAVEGUIDE TAPER OF MINIMUM LENGTH.

3,571,742. PUSH-PULL DISTRIBUTED AMPLIFIER.

3,573,666. FREQUENCY ADJUSTABLE MICROWAVE STRIPLINE CIRCULATOR.

3,577,186. INVERSION-TOLERANT RANDOM ERROR CORRECTING DIGITAL DATA TRANSMISSION SYSTEM.

3,577,194. ANALOG TO DIGITAL CONVERSION CIRCUIT.

3,578,959. DIGITAL RESOLVER WITH ALTERNATELY PHASED DIGITAL DIFFERENTIAL ANALYZERS.

3,579,148. DIRECTIONAL COUPLER FOR OVERSIZE CIRCULAR WAVEGUIDES.

3,581,212. FAST RESPONSE STEPPED-WAVE SWITCHING POWER CONVERTER CIRCUIT.

3,581,229. FACE-PUMPED LASER DEVICE WITH OPTICAL PATH FOLDING.

3,581,390. METHOD OF FORMING SINGLE TURN MAGNETIC RECORDING HEADS.

3,582,757. PARALLEL LATCHING INVERTER.

3,582,918. MAGNETIC HEAD WITH DISSIMILAR POLE PIECES.

3,587,042. RANDOM ERROR CORRECTING CODING AND DECODING SYSTEM HAVING INVERSION TOLERANCE AND DOUBLE CODE CAPABILITY.

3,588,747. WIDEBAND COMPOSITE FREQUENCY MODULATOR.

3,600,701. SIGNAL GENERATOR FOR PRODUCING A SET OF SIGNALS AT BASEBAND FREQUENCY AND WITH ADJUSTABLE PHASE SLOPE.

3,609,379. PHOTOELECTRIC DROP SENSING AND TIMING CONTROL FOR INTRAVENOUS FEED AND OTHER FLOW CONTROL APPLICATIONS.

3,609,682. AUGMENTED DIGITAL-ERROR-CORRECTING DECODER.

3,611,401. BEAM STEERING SYSTEM FOR PHASED ARRAY ANTENNA.

3,612,111. WIRE CUTTING AND STRIPPING APPARATUS.

3,631,362. FACE-PUMPED, FACE-COOLED LASER DEVICE.

3,633,126. MULTIPLE INTERNAL REFLECTION FACE-PUMPED LASER.

3,639,699. MAGNETIC TRANSDUCER HAVING A COMPOSITE MAGNETIC CORE STRUCTURE.

3,639,901. ERROR CORRECTING DECODER UTILIZING ESTIMATOR FUNCTIONS AND DECISION CIRCUIT FOR BIT-BY-BIT DECODING.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 25, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock: Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-11-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-14-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	4-24-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-15-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-1-73
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-17-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-11-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-09-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-14-73
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-09-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-15-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-14-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	6-12-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-17-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-10-73
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures: Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating: Textiles; Apparel and Shoes; Sewing Machines.	5-15-73

Expiration of patents: The patents within the range of numbers indicated below expire during June 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,794,186 to 2,797,413, inclusive
Plant Patents..... Numbers 1,606 to 1,611, inclusive

REISSUES

JUNE 11, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,037

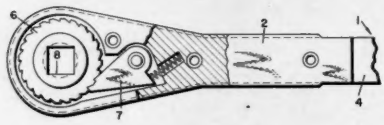
EASY RELEASE DEVICE FOR A SOCKET WRENCH

Gabriel M. La Pointe, Worcester, Mass., assignor to Parker Mfg. Company, Worcester, Mass.

Original No. 3,564,954, dated Feb. 23, 1971, Ser. No. 798,898, Feb. 13, 1969. Application for reissue Jan. 29, 1973, Ser. No. 327,302

Int. Cl. B25b *13/46*

U.S. Cl. 81—61 7 Claims



This invention relates to a push button release snap-on drive square for a ratchet operated socket wrench that projects from opposite sides of the wrench to permit sockets, screwdrivers, hand-operated knobs or the like to be detachably mounted on opposite sides of the wrench for alternate use. The socket is detached from the drive square by pressing the drive square in a direction parallel to the axis of the socket.

28,038

BODY SUPPORT DEVICE

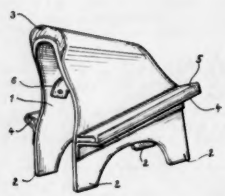
Angelo Buzzi, Rome, Italy, assignor to Christian Holzapfel KG, Ebhausen, Germany

Original No. 3,541,313, dated Nov. 17, 1970, Ser. No. 754,849, Aug. 23, 1968. Application for reissue Mar. 9, 1972, Ser. No. 233,336

Claims priority, application Italy, Aug. 31, 1967, 16,217/67

Int. Cl. A47c *7/50*; B62j *1/00*

U.S. Cl. 297—195 5 Claims



A [piece of furniture] *body support device* to sit on has a saddle-shaped seat which is inclined in one direction and a pair of knee supports located on both sides of the seat which are inclined in the opposite direction.

28,039

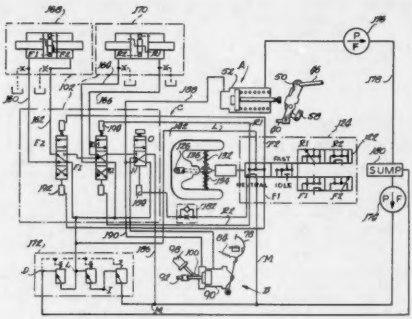
FORWARD-REVERSE, STEERING, BRAKING AND MOTOR CONTROL

Charles A. L. Ruhl, Wheaton, Ill., assignor to International Harvester Company, Chicago, Ill.

Original No. 3,386,523, dated June 4, 1968, Ser. No. 507,010, Nov. 9, 1965. Application for reissue Jan. 18, 1971, Ser. No. 107,538, which is a continuation of abandoned reissue application Ser. No. 868,249, Oct. 8, 1969

Int. Cl. B60k *29/00*; F16d *67/04*

U.S. Cl. 180—6.66 27 Claims



Forward-reverse drive control for a tractor having plural actuators for steering and for reversing the direction of motion of the tractor. The tractor is provided with a conventional engine, and an engine-driven power train comprising directional clutch packs, steering disks on one side including, e.g., a left drive disk and a left pivot disk, and similar steering disks on the other (right) side. A steering linkage is provided to release one drive disk upon actuation of one actuator and to apply the companion pivot disk upon further actuation of the one actuator, a similar linkage is provided between the other disks and another actuator, operator's brake means is provided operable upon actuation of the third actuator (foot brake) to apply both pivot brakes only, automatic brake means is provided, operable upon actuation of the fourth actuator (directional clutch selector actuator) as it passes through neutral, to neutralize the clutch packs and to apply both pivot brakes and to decelerate the engine, and a delay means, of a type effective after a delay period, is provided to reversely engage the clutch pack and release the pivot brakes and reaccelerate the engine.

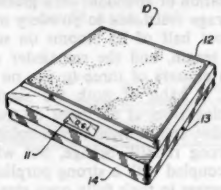
28,040
BATHROOM SCALE WITH OPTICALLY PROJECTED DIAL INDICATOR

Gerald M. Grusin, 226 N. Lakeview Ave., Chicago, Ill. 60614, and James E. Logan, 1250 Longwood Road, Lake Forest, Ill. 60045

Original No. 3,547,212, dated Dec. 15, 1970, Ser. No. 864,068, Oct. 6, 1969, which is a continuation-in-part of application Ser. No. 713,361, Mar. 15, 1968, now Patent No. 3,512,594. Application for reissue Dec. 13, 1972, Ser. No. 314,581

Int. Cl. C01g *23/26, 23/32*

U.S. Cl. 177—178 9 Claims



A bathroom scale having a projected dial indicator system of a construction such that the latter can be installed as a unitary unit.

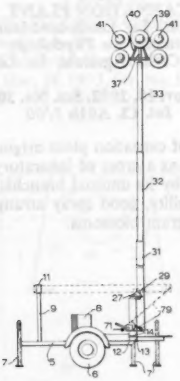
28,041
MULTIPLE STAGE EXTENSIBLE BOOM

Erich W. Loffler and Hans Kruger, Redwood City, Calif., assignors to Electro-Motion Pacific, Inc., Redwood City, Calif.

Original No. 3,586,270, dated June 22, 1971, Ser. No. 774,850, Nov. 12, 1968. Application for reissue Nov. 2, 1972, Ser. No. 303,122

Int. Cl. F21p *5/00*

U.S. Cl. 240—3 6 Claims



An extensible boom for portable lights has a two-part base. One part of the base is fixed to a trailer or other vehicle and the other part is rotatable with respect thereto about a vertical axis. Hinged to the rotatable part about a horizontal axis is a telescopic multisection boom. A first winch elevates the boom from horizontal to vertical position. A second winch controls a cable system located inside the boom sections to elevate the boom. A manually extensible top boom section may be used to increase the maximum height.

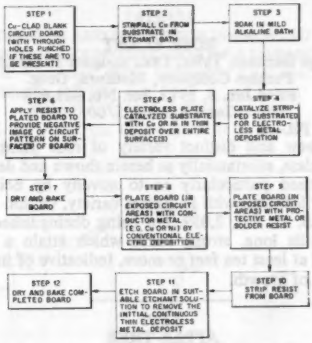
28,042
METHOD OF MAKING ADDITIVE PRINTED CIRCUIT BOARDS AND PRODUCT THEREOF

Harold L. Rhodenizer, Bethlehem, John J. Grunwald, New Haven, and William P. Innes, Cheshire, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Original No. 3,666,549, dated May 30, 1972, Ser. No. 823,354, May 9, 1969. Application for reissue June 19, 1972, Ser. No. 263,780

Int. Cl. C23c *3/02*

U.S. Cl. 117—212 9 Claims


STEP 1
Cu-CLAD BLANK CIRCUIT BOARD (WITH THROUGH HOLES PUNCHED IF THESE ARE TO BE PRESENT)
STEP 2
STRIP ALL Cu FROM SUBSTRATE IN ETCHANT BATH
STEP 3
SOAK IN MILD ALKALINE BATH
STEP 4
CATALYZE STRIPPED SUBSTRATE FOR ELECTROLESS METAL DEPOSITION
STEP 5
ELECTROLESS PLATE CATALYZED SUBSTRATE WITH Cu OR Ni IN THIN DEPOSIT OVER ENTIRE SURFACES
STEP 6
APPLY RESIST TO PLATED BOARD TO PROVIDE NEGATIVE IMAGE OF CIRCUIT PATTERN ON SURFACES OF BOARD
STEP 7
DRY AND BAKE BOARD
STEP 8
PLATE BOARD (IN EXPOSED CIRCUIT AREAS) WITH CONDUCTOR METAL (E.G. Cu OR Ni) BY CONVENTIONAL ELECTRO DEPOSITION
STEP 9
PLATE BOARD (IN EXPOSED CIRCUIT AREAS) WITH PROTECTIVE METAL OR SOLDER RESIST
STEP 10
STRIP RESIST FROM BOARD
STEP 11
ETCH BOARD IN SUITABLE ETCHANT SOLUTION TO REMOVE THE INITIAL CONTINUOUS THIN ELECTROLESS METAL DEPOSIT
STEP 12
DRY AND BAKE COMPLETED BOARD

A method is disclosed for forming printed circuit boards using the additive process. Improvement over the prior art is obtained in respect to adhesion of the conductor metal circuit to a thermoset resin substrate. In the process, a nickel or copper clad thermoset resin substrate is stripped of all metal, activated (catalyzed), a resist pattern applied to obtain the desired circuit and a conductor metal deposited on the circuit area by electroless and/or electrodeposition to a final desired thickness. At one or more points in the process the board is heated or baked. Various types of circuit boards resulting from the process are also disclosed.

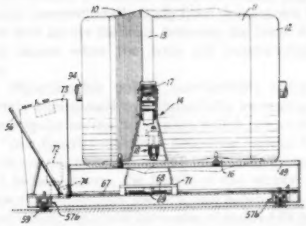
28,043
METHOD OF BUILDING A TIRE CASING FROM A STRIP OF RUBBER

Robert E. Hineline, Akron, Ohio, assignor to AMF Incorporated

Original No. 3,549,442, dated Dec. 22, 1970, Ser. No. 656,283, July 26, 1967. Application for reissue Oct. 27, 1972, Ser. No. 301,470

Int. Cl. B29h *17/20*

U.S. Cl. 156—117 10 Claims



A method of building tires, such as new off-the-road tires, on a drum arrangement whereby a strip of rubber is placed thereon as the drum continually rotates. The apparatus includes an application and sensing arm which

guides the material onto the drum in a predetermined pattern in accordance with a straight line template. The application and sensing arm moves in a straight line across the surface of the building drum to build a tire contour in accordance with the template configuration. The apparatus is portable and may be removed from a building station when not required and thus used to serve a number of building stations.

PLANT PATENTS

GRANTED JUNE 11, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,566
ROSE PLANT

George Buckner, Tyler, Tex., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Jan. 8, 1973, Ser. No. 321,678

Int. Cl. A01g *5/00*

U.S. Cl. Plt.—2 1 Claim

1. A new and distinct variety of rose plant of the climber class, substantially as herein shown and described, characterized particularly as to novelty by being substantially identical with its parent variety, Orchid Masterpiece, U.S. Pl. Pat. 2,039, but being distinguished therefrom by its long, strong canes which attain a mature height of at least ten feet or more, indicative of its climbing habit of growth.

3,567
APPLE TREE

Jack D. Slusarenko, Milton-Freewater, Oreg., assignor to Stark Bro's Nurseries & Orchards Co., Louisiana, Mo.

Filed Feb. 12, 1973, Ser. No. 331,978

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—35 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by its general resemblance to the apple variety "Super Starking Delicious"—Frank strain (Plant Pat. No. 2,440), but the fruit of which develops a full red color at least four days earlier than the fruit of "Super Starking Delicious," with consequent earlier marketability and at premium price values.

3,568
ROSE PLANT

Herbert C. Swim and O. L. Weeks, Ontario, Calif., assignors to The Conard-Pyle Company, West Grove, Pa.

Filed Feb. 12, 1973, Ser. No. 331,512

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the grandiflora class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of abundant dark green foliage which has above average resistance to powdery mildew, a habit of bearing about half of its blooms on strong stems of single cutting length, and the remainder of the blooms being borne in clusters of three to five on stems of long cutting length, a habit of both the single and cluster blooms remaining erect at all times on the stems, a distinctive, attractive and unusual flower color which is predominantly strong reddish orange, but with some deep purplish pink coupled with a strong purplish red blend as the flowers progress to their fully open stage, and a pleasing and strong tea fragrance of the flowers.

3,569
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 14, 1972, Ser. No. 280,537

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—17 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous growth, abundant basal branching, Dutch Vermillion blooms, and its resistance to rose powdery mildew.

3,570
CARNATION PLANT

Alexandre Barberet, La Londe-les-Maures, France, assignor to Laboratoire de Physiologie Vegetale de La Londe Societe Civile Agricole, La Londe-les-Maures, France

Filed Nov. 10, 1972, Ser. No. 305,341

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—73 1 Claim

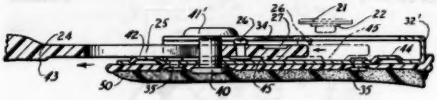
A new variety of carnation plant originated as a hybrid seedling produced as a cross of laboratory breeding stock and distinguished by its unusual branched growth having longer stem capability, good spray arrangement and well formed, more fragrant blossoms.

PATENTS

GRANTED JUNE 11, 1974

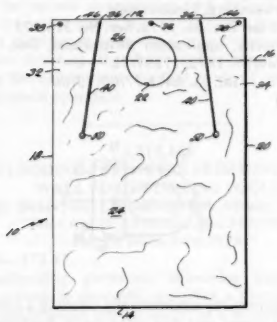
GENERAL AND MECHANICAL

3,815,152
SAFETY FOOTBALL HELMET
Daniel Bednarczuk, 153-15 89th Ave., Jamaica, N.Y. 11342, and Arnold T. Milton, 2 Olmstead Rd., Scarsdale, N.Y. 10583
Filed Oct. 30, 1972, Ser. No. 301,878
Int. Cl. A41d *13/00*
U.S. Cl. 2—9 **8 Claims**



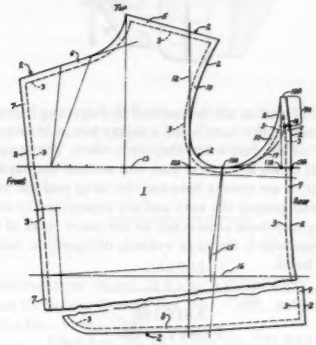
The present invention includes an improved football player's helmet capable of providing improved protection against what is commonly known as "spearing" and face-guard tackles. The safety helmet or football helmet disclosed by the present invention includes a relatively rigid helmet portion formed with a recess for receiving and protecting the upper and side portions of the user's head, a chin strap removably secured to the helmet in order to hold same upon the head of the user, and a face-guard assembly which functions both as an additional protective device as well as being cooperative with the chin strap such that, upon preselected and undesirable movement of the face-guard in a forward direction, the chin strap is rendered inoperative and releases the helmet from the user's head.

3,815,153
PROTECTIVE GARMENTS
Matt J. Vitol, Woodstock, Va., assignor to Becton-Dickinson and Company, East Rutherford, N.J.
Filed Mar. 29, 1973, Ser. No. 346,020
Int. Cl. A41d *13/04*
U.S. Cl. 2—51 **5 Claims**



There is disclosed an apron-like body cover integrally and seamlessly fashioned from a rectangular piece of flexible sheet material, losing only a neck hole and two tie base stress-spreading holes. The ties are relatively wide and increase in width along their extent from the bases thereof. The distal ends of the ties are initially joined to the main body by frangible connections which assist in packaging of the body covers and in their being dispensed from hanging supports.

3,815,154
METHOD OF AND MEANS FOR IMPROVING THE ARMHOLE CONSTRUCTION OF A GARMENT
George E. Gearhart, 1924 Goldsmith Ln., Apt. No. 22, Louisville, Ky. 40218
Filed Dec. 7, 1972, Ser. No. 312,886
Int. Cl. A41d *27/10*
U.S. Cl. 2—93 **4 Claims**



A man's coat of (say) size 40 has a 40 inch horizontal breastline. The pattern for each (right and left) front panel of that coat has, at its upper rear corner, a triangular section, the sides edges of which extend upwardly from the breastline and correspond to the respective cut edges of the upwardly curved lower rear portion of the armhole and the corresponding portion of the rear side margin of the panel. The apex of the triangular section is flat, being characterized by a short top extending horizontally about one-fourth of an inch from one side edge of the triangular section to the other. The height of the triangular section from the breastline up to its flat top, which is actually equal to one-sixteenth of the breastline, is designated by tailors as "1/8th of the breastline." Thus, in coat sizes 38, 40, and 42 inches, the "triangular" section approximates 2¼ inches, 2½ inches and 2-¾ inches, respectively. A man's coat conventionally made from that pattern tends, when worn, to pull across the back between the lower halves of the armhole seams when the arms are outstretched and then crossed.

This objectionable pull is substantially reduced (if not completely eliminated) by substantially increasing the height of the triangular section to a value, which tailors would recognize as "one-fourth inch of the breastline" minus ⅛ inch more or less. In coat sizes 38, 40 and 42 inches, the increase approximates 2 inches, hence, the height of the section in the sizes mentioned approximates 4¼, 4½, and 4-¾ inches, respectively. These values represent increases of about 188 percent, 180 percent, and 173 percent of the conventional heights in the sizes mentioned.

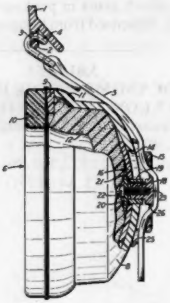
Hereafter, the expressions "one-eighth BL," "one-fourth BL," etc., will be used to designate dimensions actually equal respectively to 1/16th of the breastline dimension, one-eighth of the breastline dimension, etc.

3,815,155

ADJUSTABLE EAR COVERS FOR SAFETY HATS

Ellison L. Davison, Gibsonia, Pa., and Monroe K. Deutsch, New Shrewsberry, N.J., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Oct. 19, 1972, Ser. No. 298,958
Int. Cl. A42b *1/06*
U.S. Cl. 2—209 3 Claims



The ends of a strap are connected by fastening members to opposite sides of the bottom of a safety hat at locations that are in front of the ears when the hat is worn. The strap slants from the hat down across the ears and around the nape of the neck. A pair of ear covers between the strap and the head engage the head around the ears and are connected to the strap by retaining members connected to the outer sides of the ear covers, across which the strap extends obliquely to hold them against the head.

3,815,156

PANTY HOSE

Albert C. Gaither, Newton, N.C., assignor to Ridgeview Hosiery Mill Company, Newton, N.C.

Filed Apr. 18, 1973, Ser. No. 352,475
Int. Cl. A41b *9/04*
U.S. Cl. 2—224 R 1 Claim

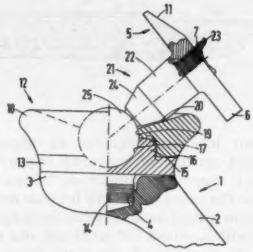
A panty hose garment constructed of knitted fabric and incorporating stocking tubes, each having a foot, leg and upper portion with the upper portions being joined together along a center seam thus defining the panty portion of the panty hose garment. The crotch area of the panty hose garment is provided with an insert of knitted material having larger interstices defining air passages than in the knitted material forming the remainder of the panty hose garment thereby providing effective ventilation of the portion of the body of the wearer covered by the crotch insert. The knitted fabric of the panty hose garment enables the panty hose garment to stretch to fit different sizes of wearers and to snugly embrace or engage the portion of the body of the wearer covered by the panty hose garment.

3,815,157

PROSTHETIC SHOULDER JOINT DEVICES

Jan Skorecki, Bramhall, and Victor Henry Wheble, Stockport, both of England, assignors to National Research Development Company, London, England

Filed Nov. 22, 1972, Ser. No. 308,787
Claims priority, application Great Britain, Nov. 30, 1971, 55438/71
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 6 Claims



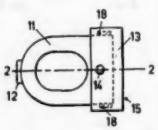
An endoprosthetic shoulder joint device has ball and socket components held in captive bearing engagement and demountably connectable with scapular and humeral fixation components. This facilitates use in that the fixation components can be secured first and then subsequently interconnected by a pre-assembled bearing assembly. The bearing assembly of ball and socket components can itself be demountable, and these components can be interchangeably connected with the two fixation components.

3,815,158

ARRANGEMENT FOR AUTOMATICALLY CLEANING A CLOSET SEATING SURFACE ON A CLOSET SEAT RING AFTER USE

Conrad Wolfgang Schnyder, and Erika Schnyder-Seibert, both of 9497 Triesenberg, Liechtenstein

Filed Dec. 26, 1972, Ser. No. 318,175
Claims priority, application Switzerland, Dec. 27, 1971, 19016/71; Nov. 27, 1972, 17257/72
Int. Cl. A47k *17/00, 13/00*
U.S. Cl. 4—1 29 Claims

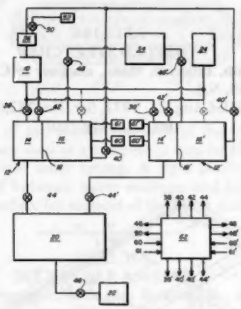


An arrangement for automatically cleaning a closet seating surface on a closet seat ring after use is disclosed. The arrangement comprises a cleaning box disposed behind or laterally of a closet bowl and containing means for washing, disinfecting and drying the seating surface on the seat ring which, for this cleaning, is turned up into a vertical position and then moved into the cleaning box. In this movement, the seat ring is guided by guide rails; it can be moved manually or by power driven means.

3,815,159
SEWERAGE TREATMENT SYSTEM

R. Edward Delaney, New Britain, and Alan H. Cornish, Newington, both of Conn., assignors to Koehler-Dayton Inc., New Britain, Conn.

Filed Nov. 8, 1972, Ser. No. 304,760
Int. Cl. E03d 5/14
U.S. Cl. 4—10 10 Claims



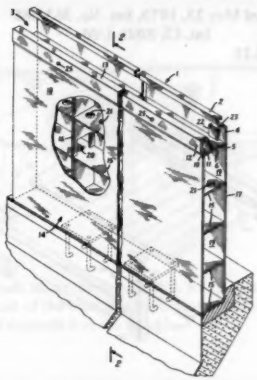
A sewerage treatment system comprising a water closet, a bathing facility, first and second recirculating tanks each including filtering media for dividing the tanks into horizontally adjacent receptacle and filtrate compartments and a drain in the receptacle compartments thereof, means for selectively directing the effluent flushed from the water closet into the receptacle compartment of either recirculating tank, means for selectively directing the effluent from the bathing facility into either recirculating tank, means for selectively draining either recirculating tank, means for selectively recirculating the liquid in the filtrate compartment of either recirculating tank to the water closet for flushing same, means for operating the system in a first mode of operation wherein the effluent from the water closet is discharged into the receptacle compartment of the first recirculating tank, the liquid in the filtrate compartment of the first recirculating tank is selectively recirculated to the water closet, and the effluent from the bathing facility is discharged into the second recirculating tank, and means for alternately operating the system in a second mode of operation wherein the effluent from the water closet is discharged into the receptacle compartment of the second recirculating tank, the liquid in the filtrate compartment of the second recirculating tank is selectively recirculated to the water closet, and the effluent from the bathing facility is discharged into the first recirculating tank, and means for draining the first recirculating tank and for switching the system from the first mode of operation to the second mode of operation.

3,815,160
NONFLOODING PERIMETER SKIMMING GUTTER WALL FOR SWIMMING POOLS

William H. Baker, 403 Londonville Rd., Albany, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,910
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.17 18 Claims

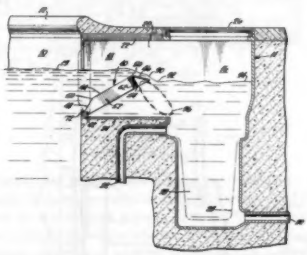
A nonflooding perimeter skimming gutter wall for swimming pools is provided, including a first gutter conduit for disposition about the perimeter of a swimming pool, and adapted to carry water at a level below a predetermined level of water in the swimming pool, a retaining wall on the poolside of the first gutter conduit over the top of which wall a skimming flow of water may run from the pool into the first gutter conduit, a second gutter conduit within a peripheral wall below the first gutter conduit and adapted to carry water at a level above a predetermined level of water in the first gutter conduit, and a fluid flow connection between the two gutter conduits at such level and below the top of the retaining wall allowing water to flow from the first gutter conduit into the second gutter conduit whenever the water level on the first gutter conduit reaches the fluid flow connection, thereby inhibiting filling of the first gutter conduit appreciably above such level.



3,815,161
SWIMMING POOL SURFACE SKIMMING WEIR

William O. Baker, Corona Del Mar, Calif., assignor to Baker Hydro Inc., Irvine, Calif.

Filed Apr. 16, 1973, Ser. No. 351,810
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.17 18 Claims

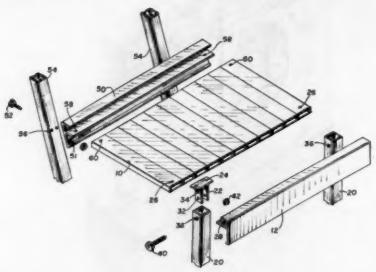


A weir for use in a swimming pool skimmer is pivotally mountable in the throat of the skimmer and has a large flat surface facing toward the entrance to the throat. The upper end of the weir is also a flat surface, the plane of which intersects the plane of the other flat surface at an angle of about 45°. The weir is hollow under the angularly disposed surface and that surface terminates in a sharp edge, so that when water is drawn from the pool into the skimmer to achieve a skimming action, the water flows across the sloping surface in close and quite uniform proximity thereto regardless of the angle of inclination of the weir, and dips downwardly as it leaves the edge of the weir and enters the well of the skimmer.

3,815,162
METHOD AND APPARATUS FOR READY INSTALLATION AND RE-INSTALLATION OF A FLEXIBLE LINER FOR SWIMMING POOLS

Raymond L. Hall, 8 Knollwood Trail, E., Brookside, N.J. 07926

Filed May 23, 1973, Ser. No. 363,089
Int. Cl. E04h 3/16
U.S. Cl. 4—172.21 **18 Claims**

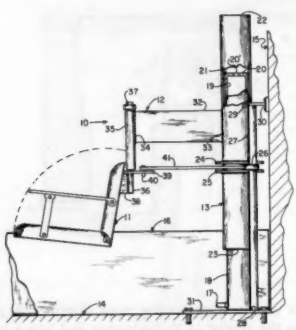


This invention pertains to swimming pools and particularly those above ground pools or in ground pools in which a flexible liner is supported by a wall. In this invention the upper edge of the liner is retained by a clamping means or a lock-in means which is protected by a coping or deck extension. The support structure is provided with a pair of holes spaced one above the other and adapted to receive an adjusting or retaining pin which permits the coping or an attached deck to be lifted sufficiently from its "at rest assembly condition" for the liner to be installed or loosened for replacement without disassembly of the coping and attached deck as well as the support frame of the swimming pool.

3,815,163
BATH LIFT APPARATUS

Lawrence J. Sullivan, 2688 East 25th St., Odessa, Tex. 79760

Filed Jan. 7, 1972, Ser. No. 216,160
Int. Cl. A47k 3/12
U.S. Cl. 4—185 L **11 Claims**



Apparatus for lifting a chair from without to within a bath tub, and vice versa. A person seated in the chair of the apparatus is lifted vertically upward, moved laterally into overhanging relationship with respect to the bath tub, and lowered into proximity of the bottom of the tub. After completing the bath, the person is lifted vertically upward, moved laterally away from the tub, and moved vertically downward, where the person can then be transferred to a wheel chair or the like.

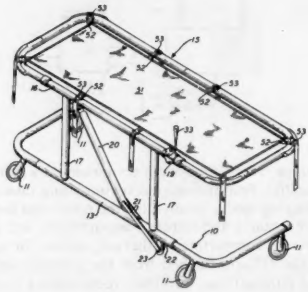
The chair of the bath lift apparatus is suspended in journaled relationship from a cantilever arm and a pilot arm maintains the chair orientated in a particular direction as it is moved.

The apparatus includes means by which a domestic water supply can be utilized as a power source for actuating the apparatus. A cam and cam follower apparatus, together with a switch means enables the chair to be automatically guided along the before described path of travel.

3,815,164
WHEELED STRETCHER

David J. Smith, Billerica, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Aug. 21, 1972, Ser. No. 282,086
Int. Cl. A61g 7/10
U.S. Cl. 5—81 **2 Claims**



A patient lifting and transporting vehicle having a U-shaped base frame with four wheels, two telescopic tubes extending upward from the base frame, a rectangular upper frame provided with a removable strong transfer sheet for supporting a patient, said upper frame being fixed on the upper ends of the telescoping tubes, and operating mechanism comprising a lifting arm assembly hinged at its lower end to the base frame and at its upper end to a follower block slidable in one tubular side of the upper frame, said tubular side containing a drive screw engaging the follower block and crank-operated bevel gears for rotating the drive screw. When the upper frame is in its lowest position the lifting arm assembly lies at an angle of about 45° from the horizontal; as the lifting arm is moved, by the drive screw and follower block, toward a vertical position the upper frame is raised correspondingly to a highest position when the arm is vertical. Springs under compression in the telescoping tubes counterbalance part of the weight of the loaded upper frame. The location of the telescoping tubes on one side of the base frame and spaced from its ends enables the upper frame to be moved over a bed or operating table or into the range of an X-ray machine.

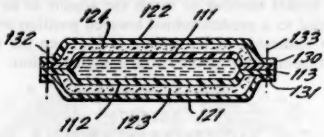
3,815,165
LIGHT-WEIGHT, MINIMUM-VOLUME WATER PAD

Sidney Tobinick, Oldbridge, and Arnold Seminoff, Fort Lee, both of N.J., assignors to Aqua Therm Products Corporation, Rahway, N.J.

Division of Ser. No. 199,853, Nov. 18, 1971, Pat. No. 3,702,484. This application Sept. 15, 1972, Ser. No. 289,431The portion of the term of this patent subsequent to Nov. 14, 1989, has been disclaimed.
Int. Cl. A47c 27/08
U.S. Cl. 5—348 WB **6 Claims**

A low-water volume, low-weight water pad for use as a mattress or seat pad consists of a water-filled container sandwiched between an upper and lower layer of cellular foam sheets with a surrounding water-impervious sheath which is

loaded through openings in the top of the sheath. The sheath serves as a flexible frame and tray for containing water which may escape from the water-filled container. The top surface of the sheath contains flaps at either end which extend beyond the opening slits in the top of the sheath. These flaps are enveloped inside of the sheath and around the bottom of the foam layer. When used as a mattress, it may be placed directly on a conventional inner spring. A rigid platform is shown which is placed between water mattress and inner spring to provide a flat surface for support of the water mattress.

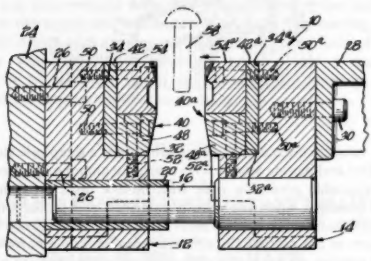


3,815,166

DIE HOLDER ASSEMBLY

Henry Anton Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 5, 1972, Ser. No. 295,149
Int. Cl. B21g 3/16
U.S. Cl. 10—2 **3 Claims**



The present invention relates generally to improvements in die holder assemblies, and more particularly to novel and practical improvements in the design of die holder assemblies which are employed to swage or pinch point screw blanks and the like. An embodiment of the invention disclosed herein includes a pair of relatively shiftable unitary assembly sections or heads having upper die holder accommodating cavities. The lower portions of said heads accommodate ram members which guide the heads in the horizontal relative shifting thereof. Novel means is provided for securing a die holder in said cavity in such a manner as to facilitate the ease with which a die holder may be attached to or disengaged from said heads.

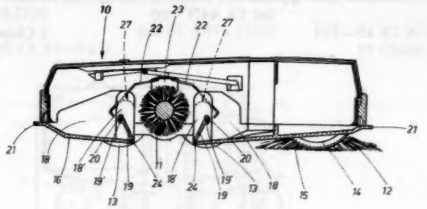
3,815,167

BRUSHING APPARATUS

Guenter Leifheit, Nassau, Lahn, Germany, assignor to Leifheit International Guenter Leifheit KG, Nassau, Lahn, Germany

Filed Oct. 31, 1972, Ser. No. 302,590
Claims priority, application Germany, Nov. 5, 1971, 2154971
Int. Cl. A47l 11/08
U.S. Cl. 15—42 **10 Claims**

A brushing apparatus for carpets and the like has a housing one side of which faces a surface to be brushed and is provided with a plurality of wall portions connected with one another by weakened hinge-like zones so that these wall portions are provided in flat condition and can then be displaced relative to one another to a condition in which they define a trough. A brush extends along the trough and, when rotated in response to movement of the brushing apparatus over the surface, picks up dirt and deposits it in the trough.

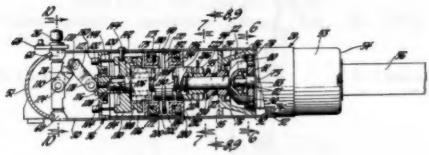


3,815,168

UNITIZED WINDSHIELD CLEANING SYSTEM

James L. Hussey, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1972, Ser. No. 308,278
Int. Cl. B60s 1/46
U.S. Cl. 15—250.02 **5 Claims**



In a preferred form, this disclosure relates to a unitized windshield cleaning apparatus having a wiper unit for oscillating a pair of windshield wipers across a windshield of an automotive vehicle between inboard and outboard positions during running operation and to a depressed parked position spaced from the inboard position when running operation is being terminated and a washer unit for delivering washer fluid to the windshield when energized. The windshield cleaning apparatus comprises a housing means, a drive means for effecting oscillation of the wipers between their inboard and outboard positions, a parking mechanism having an interruptable driving connection with the drive means to effect movement of the wipers to their parked position when wiper operation is being terminated, a washer pump assembly having an interruptable driving connection with the drive means of the wiper unit and a clutch means including a single shiftable clutch element for selectively drivingly connecting the washer pump assembly with the drive means of the wiper unit or drivingly connecting the park mechanism with the drive means of the wiper unit when termination of wiper operation is desired.

3,815,169

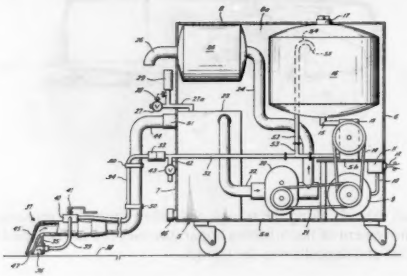
APPARATUS FOR DRY CLEANING OF FABRICS IN SITU

Scott W. Mooring, Fort Worth, Tex., assignor to Steamatic, Inc., Ft. Worth, Tex.

Continuation-in-part of Ser. No. 206,059, Dec. 8, 1971, abandoned. This application Feb. 16, 1972, Ser. No. 226,697

Int. Cl. A47l 7/00

U.S. Cl. 15—321 **1 Claim**



Apparatus for dry cleaning of fabrics and textiles without collection, purifying, and/or recirculation of the used solvent.

3,815,170

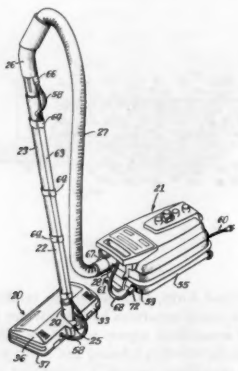
CLEANING NOZZLE ATTACHMENT FOR A SUCTION CLEANER

Joseph F. Brooks, Bloomington, and Robert B. Meyer, Normal, both of Ill., assignors to National Union Electric Corporation, Greenwich, Conn.

Filed June 30, 1972, Ser. No. 268,126

Int. Cl. A47l 5/34

U.S. Cl. 15—359 **8 Claims**



A cleaning nozzle attachment for a canister-type suction cleaner or built-in cleaning system, wherein an electric motor driven brush roll is rotatably mounted in a suction chamber in the body of the attachment so as to agitate a portion of the rug or carpet underlying the suction opening of the attachment when the latter is in operation. A socket member is pivotally mounted at the rear of the body and serves to communicate suction to the suction chamber through a plurality of connected tubular wands which are detachably connected to the socket member and which provide a handle for manipulating the attachment. A pair of wheels are carried by the wand socket member and the downward thrust component from the wands is transmitted to the wheels rather than to the socket member by mounting the wheels on the socket member so that the wheel axis is substantially intersected by the axis of the wands. A lost motion connection between the wand socket member and the nozzle body permits substantially vertical relative movement therebetween so that the nozzle body "floats" bodily on the surface of a rug or carpet being cleaned. A pair of ramps are provided on the nozzle body which coact with a pair of trunnion pins on the wand socket member to cause the wheels to be positively extended to a predetermined lowered position with respect to the underside of the nozzle body when the wands and socket member are pivoted to an upright position.

3,815,171

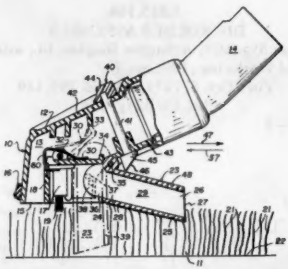
VACUUM CLEANER NOZZLE

Keith E. Carr, and Robert E. Johnson, both of St. Paul, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 18, 1972, Ser. No. 273,023

Int. Cl. A47l 9/02

U.S. Cl. 15—369 **11 Claims**



A vacuum cleaner nozzle movable over a deep pile rug and the like and having a body with a suction chamber portion and a retractable pivotable rake with hollow tines providing air flow passages when the rake is extended and pulled through the pile in order to exert a suction cleaning effect down to the bottom of the pile. The nozzle may also include a narrow rear wall portion on each tine with diverging sides toward a front wall portion so that the tines of the rake thereby act as pile penetrating plows when the nozzle is pulled across deep pile rugs. The disclosure also includes a releasable retainer for retaining the rake in a retracted position as for surface cleaning and a movable cam for urging the rake from its retracted position toward an automatic operating position for cleaning a deep pile rug. In the automatic operating position, the tines of the rake automatically pivot backward as the nozzle is pushed forward, and pivot to an extended pile penetrating position as the nozzle is pulled backward. The disclosure also includes a movable valve in the nozzle body movable by the rake between a first location blocking air flow through the nozzle inlet when the rake is in extended automatic operative position for deep cleaning and grooming of long pile fibers, and movable to a second location blocking the flow of air into and through the hollow tines when the rake is in retracted inoperative position as when the nozzle is used for surface cleaning.

3,815,172

WET/DRY SUCTION CLEANER

Charles Thomas Fromknect, and Martin Edward Harbeck, both of Anderson, S.C., assignors to The Singer Company, New York, N.Y.

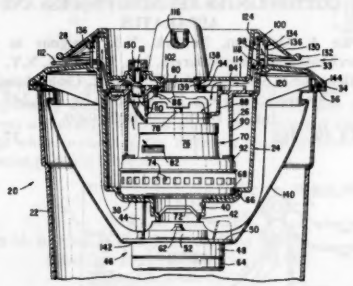
Filed Jan. 3, 1973, Ser. No. 320,802

Int. Cl. A47l 5/00, 7/00

U.S. Cl. 15—413 **10 Claims**

A wet/dry suction cleaner having a dirt storage receptacle and a power suction module mounted thereon. The module in-

cludes three housings between the lower two of which is mounted a by-pass motor-blower unit which together with the intermediate housing is entrapped between the lower and upper housings. An air shut-off valve assembly depends downwardly from the lower housing into the receptacle. The intermediate housing is a separator member having annular walls which separate the blower working airflow from the motor cooling airflow. The upper housing has an exhaust port



which communicates with the blower airstream. Motor cooling air enters between the top and bottom housings and must flow under and over a labyrinth of vertical walls formed by the upper and intermediate housings before entering the motor between the upper and intermediate housing. The cooling air exits the motor to a cooling air exhaust chamber formed by annular walls of the intermediate housing and exhausts therefrom between the upper and intermediate housings up and under a labyrinth similar to its entry.

3,815,173

CASTER FOR PIECES OF FURNITURE AND THE LIKE

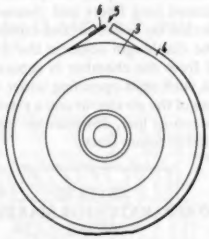
Berthold Haussels, Wermelskirchen-Tente, Germany, assignor to Firma Happe & Co., Tonisheibe, Germany

Filed Dec. 30, 1971, Ser. No. 214,178

Claims priority, application Germany, Dec. 30, 1970, 2064359

Int. Cl. A47b *91/00*

U.S. Cl. 16—45 **6 Claims**



A rubber-tired caster for pieces of furniture or the like is peripherally encased in a ring of rigid sheet material, such as polyamide film, to facilitate moving over carpeted floors. For use on wood or other hard surfaces, the ring can be stripped off, allowing the compressed rubber rim to expand to substantially the same diameter.

3,815,174

SUSPENSION DEVICE FOR DISPLACEABLY SUSPENDING DRAPES AND CURTAINS

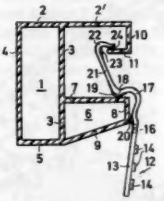
Marianne Seitz, Waltherstrasse 3, 8500 Nurnberg, Germany

Filed Dec. 18, 1972, Ser. No. 316,256

Claims priority, application Germany, Dec. 17, 1971, 2162730

Int. Cl. A47h *15/00*

U.S. Cl. 16—94 D **15 Claims**



A device for displaceably suspending drapes and curtains, which includes a profiled rail having a slide strip which in mounted position of the rail extends along a horizontal plane and on which displaceably rests a plurality of slide members, each slide member resting on said slide strip by means of a first rounded or spherical surface portion thereof. Each slide member is furthermore provided with a second rounded or spherical surface portion for sliding engagement with a guiding strip forming part of the profiled rail, when the respective slide member to which the drapes or curtains are connected tilts, e.g., when the drapes or curtains should swing back and forth, to thereby prevent disengagement of the respective slide member from the profiled rail.

3,815,175

KITCHEN UTENSILS WITH REMOVABLE GRIPS

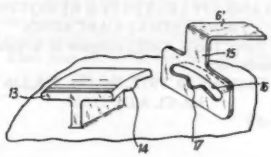
Lydia Szabados, nee Borbas, Residence Trocedero Parly 2 - 10 Square Poussin, Le Chesnay (Yvelines), France

Filed Apr. 3, 1972, Ser. No. 240,357

Claims priority, application France, Apr. 26, 1971, 71.14823

Int. Cl. A47b *95/02*

U.S. Cl. 16—114 **11 Claims**

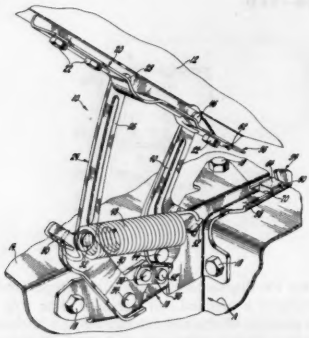


A removal grip capable of cooperating with lugs or knobs mounted on kitchen utensils, other vessels or their lids. The removable grip comprises one part forming the grip proper provided at its extremity with a small plate having a cut-out of an arc of a circle with in the convex part of this cut-out at least one notch shaped as an arc of a circle with on at least one side of the plate, at least one support point placed in the surface, perpendicular to the plate having as directrix the edge of the cut-out directed towards the grip part, the lugs or knobs fixed on the utensil or its lid having one part in a cylindrical sector capable of being adapted to the cut-out of the small plate by making it project sufficiently beyond the said cut-out to come to gain support against the said support point, this part in cylindrical sector comprising on its concave face at least one truncated rib capable of fitting into the notch or the notches of the arc of the circle of the small plate of the grip.

3,815,176
VEHICLE BODY HOOD HINGE

Charles L. Porter, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1973, Ser. No. 384,979
Int. Cl. E05d *1/00*
U.S. Cl. 16—128.1 **3 Claims**

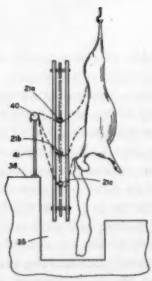


A hinge for the rear end of a hood that selectively closes a vehicle body forward engine compartment opening includes interconnected body and hood hinge members movable relative to each other between hood open and closed positions. The rear end of the body hinge member includes a planar hook-shaped flange located in a vertical orientation and defining a forwardly facing notch, and the rear end of the hood hinge member includes a generally planar flange defining an elongated rearwardly opening slot. As the hinge members move to the hood closed position, the flange of the hood hinge member moves to a generally horizontal operation and into an interreceived relationship with the flange of the body hinge member so that the notch receives the hood flange and the slot receives the body flange to limit forced movement of the rear end of the hood in vertical, lateral and rearward directions. A resilient stop mounted on the body hinge member adjacent the notched flange thereof engages the hood hinge member adjacent its slotted flange so as to resiliently position the flanges with respect to each other.

3,815,177
METHOD AND APPARATUS FOR REMOVING HIDES FROM ANIMAL CARCASSES

Melburn W. Haws, Davis, Calif., assignor to Armour and Company, Phoenix, Ariz.

Filed Feb. 10, 1972, Ser. No. 225,236
Int. Cl. A22c *21/00*
U.S. Cl. 17—50 **3 Claims**

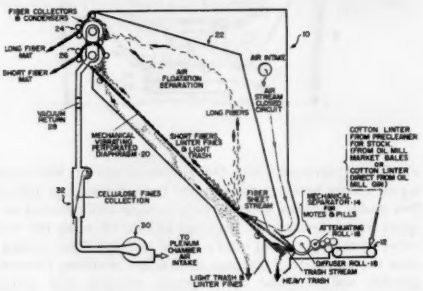


A method for removing the hide from animal carcasses in which the animal carcass is suspended on a conveyor and the end portion of the hide is loosened and put over a stationary holder and held in contact with this holder while a roller is pressed downwardly against the hide between the stationary holder and the carcass. The invention also refers to apparatus which includes a chain to which outwardly extending arms are attached. On operation the arms descend to push the rollers downwardly against the hide.

3,815,178
COTTON LINTER REFINING PROCESS AND APPARATUS

Maurice A. Goldman, Newark, N.J., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 746,627, July 22, 1968, abandoned. This application Aug. 7, 1972, Ser. No. 278,249
Int. Cl. D01b *3/00*; **B07b** *9/00*
U.S. Cl. 19—205 **37 Claims**


FIBER COLLECTORS & CONDENSERS
LONG FIBER MAT
SHORT FIBER MAT
AIR FLOTATION SEPARATION
AIR INTAKE
AIR STREAM CLOSED CIRCUIT
VACUUM RETURN
MECHANICAL VIBRATING PERFORATED DIAPHRAGM
LONG FIBERS
SHORT FIBERS, LINTER FINES & LIGHT TRASH
COTTON LINTER FROM PRECLEANER FOR STOCK (FROM OIL MILL MARKET BALES OR COTTON LINTER DIRECT FROM OIL MILL GIN)
CELLULOSE FINES COLLECTION
FIBER SHEET STREAM
MECHANICAL SEPARATOR FOR MOTES & PILLS
ATTENUATING ROLL
TO PLENUM CHAMBER AIR INTAKE
DIFFUSER ROLL
TRASH STREAM
LIGHT TRASH & LINTER FINES
HEAVY TRASH

Cotton linter pills, produced by the processing of cotton seed at an oil mill, are fed in blanket formation into a roller assembly wherein an attenuating roll and a diffuser roll act thereon to untangle them and separate fibers from trash with the diffuser roll propelling the fibers and trash into a sealed plenum chamber below a high speed air stream of a closed air circuit entering the chamber so that the heavy trash falls into a discharge means in the low pressure area under the air stream with the fiber stream being caught up and carried by the air stream impinging therewith on the lower end portion of an upwardly inclined rocking and vibrating, perforated diaphragm in the chamber so that the longest free fibers rise with the bounce of the air stream off the diaphragm into the upper expanse of the chamber and the shorter fibers, linter fines and light trash move up the diaphragm that acts to siftingly discharge the linter fines and lighter trash downwardly therethrough into an underlying low pressure area collection means. The cleaned long fibers and cleaned short fibers are separately collected by collector and condenser units at the upper end of the diaphragm adjacent the top of the chamber and discharged from the chamber in separate long fiber and short fiber mats, such units operating under vacuum produced by the return line of the air circuit and a retention means being provided in the return line, downstream from such units, for collecting sheeted cellulose fines.

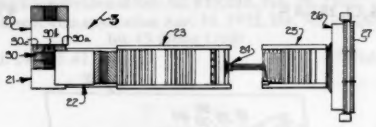
3,815,179
METHOD AND APPARATUS FOR MAKING SPACE-DYED YARNS

James Melvin Moore, Greenville; William Gilbert Newell, Asheville; Anthony Everette Hampton, Asheville, and Philip Elmo Jackson, Asheville, all of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Oct. 20, 1971, Ser. No. 191,004
Int. Cl. D04h *11/04*
U.S. Cl. 19—163 **5 Claims**

Space-dyed yarn rovings or rovings having successive portions of relatively different dye affinity are produced for the

subsequent spinning of yarns therefrom by forming a sliver or a lap of slivers having successive portions of relatively different color and/or dye affinity characteristics, and feeding the sliver or lap into a finisher carding machine with the portions thereof of relatively different characteristics entering the

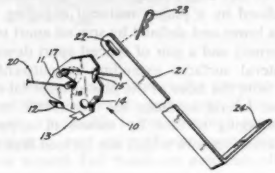


carding machine in succession so as to form a carded web of corresponding successive portions. The carded web is then split into a plurality of strips which are converted into yarn rovings while preserving the different characteristics of the successive portions thereof.

3,815,180
WIRE STRETCHER

Kermit M. De Haai, R.R. 1, Monroe, Iowa 50170

Filed Oct. 20, 1971, Ser. No. 191,001
Int. Cl. A44b *21/00*
U.S. Cl. 24—71.2 **1 Claim**

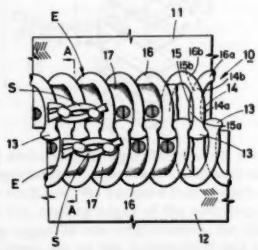


A wire stretcher including a disc with retaining teeth about the periphery thereof. A staple formed from a round metal bar extends through a pair of openings in the disc, and the free ends of the staple are spread apart to retain the staple in the disc. A handle is releasably attached to the center portion of the staple for rotating the disc and applying tension to a wire initially threaded between the free ends of the staple.

3,815,181
ZIP FASTENERS

Hiroyuki Sekine, Ichikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1972, Ser. No. 254,734
Claims priority, application Japan, Dec. 30, 1971, 47-1397[U]
Int. Cl. A44b *19/12, 19/34*
U.S. Cl. 24—205.1 C **4 Claims**

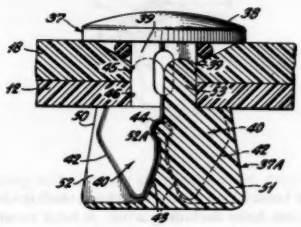


A zip fastener comprising a pair of opposed stringer tapes and rows of fastener elements secured thereto. These fastener elements are in the form of continuous helical coils and are relatively flat as cross-sectionally observed so as to provide greater flexibility. The rows of fastener elements are sewn to the stringer tapes closely along the coupling head portions of the elements so as to assure the proper engagement of the fastener elements.

3,815,182
KNOCK DOWN LUGGAGE HAND-MANIPULATED FASTENER UTILIZING LOCK BUTTON

Edward J. Guard, and Robert F. Oliver, both of Maitland, Fla., assignors to Go Luggage Corporation, Maitland, Fla.

Division of Ser. No. 33,644, May 1, 1970, Pat. No. 3,710,901, which is a continuation-in-part of Ser. No. 669,459, Sept. 21, 1967, abandoned. This application Oct. 19, 1972, Ser. No. 298,866
Int. Cl. F16b *13/06*
U.S. Cl. 24—208 A **8 Claims**

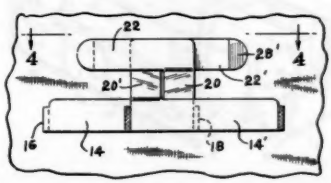


A two-piece hand-manipulated fastener comprising a first member with flexible prongs adapted to flex into an overlapping side by side relationship while being inserted through a workpiece aperture and then expanding to engage the reverse side of the workpiece. A second member in the form of a lock button with a pair of recesses is inserted into the workpiece aperture between the flexible prongs to lock the fastener in position.

3,815,183
WAISTBAND FASTENER

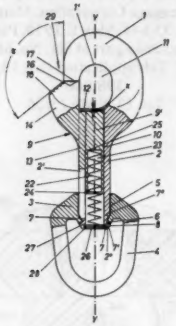
Domenic John Daddona, Jr., Waterbury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed June 15, 1972, Ser. No. 263,150
Int. Cl. A44b *13/00*
U.S. Cl. 24—227 **2 Claims**



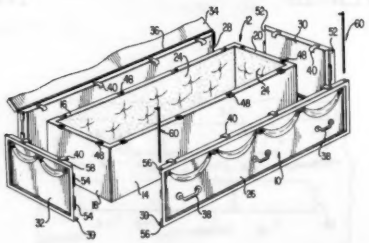
Waistband fastener has identical hooking parts. Will not be damaged in laundry or dry cleaning pressing operation. Broad side of staple points are perpendicular to line of pull, giving fastener considerable strength against pull-out.

3,815,184
SWIVEL HOOKS
Werner Hopp, Oberstein, Germany, assignor to Firma Gebr. Batz, Heiligenhaus, Germany
Filed Oct. 25, 1972, Ser. No. 300,712
Claims priority, application Germany, Aug. 2, 1972, 2237920
Int. Cl. A44b 13/02
U.S. Cl. 24—239 9 Claims



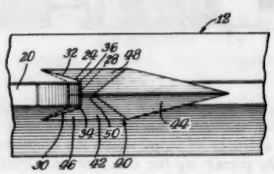
A carbine hook which comprises a hook shaft leading into a hook head, the latter including a top. A hook mouth, and a slide closing the hook mouth and guided on the hook shaft are provided. The hook mouth includes a hook end face, and the slide has an outwardly projecting operational face. A slide abutment face is disposed opposite the hook end face, and the operational face starts within the range of the slide abutment face moving toward the hook end face.

3,815,185
BURIAL SYSTEM WITH REUSEABLE OUTER CASKET
Alfred E. Owens, 116 Alta Vista Ave., Waterloo, Iowa 50703
Filed Feb. 9, 1973, Ser. No. 331,264
Int. Cl. A61g 17/00
U.S. Cl. 27—3 6 Claims



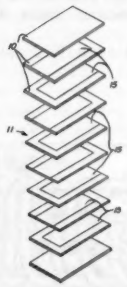
A burial system comprising an outer, reuseable casket and an inner coffin. The casket and coffin are provided with means to suspend the side and end walls of the casket from the coffin. Locking pins retain such side and end walls of the casket in suspended assembly around the coffin.

3,815,186
FELTING NEEDLE
Edson P. Foster, P.O. Box 527, 409 S. 29th St., Manitowoc, Wis. 54220
Filed Aug. 3, 1972, Ser. No. 277,731
Int. Cl. D04h 18/00
U.S. Cl. 28—4 N 4 Claims



This invention relates to the spur construction for a felting needle having an elongated body and a pointed end portion at its lower end. The elongated body is formed with one or more rounded corner edges and a plurality of barbs are formed along the body portion in a centered relation with the rounded lengthwise corner edges using a novel spur-forming tool. The spur is defined by a planar material engaging surface of a width at its lower end defined by spaced apart obtuse angled exterior corners and a pair of spaced apart downwardly converging lateral surfaces extending in outwardly diverging directions from the sides of the planar material engaging surface. These lateral surfaces are connected to the planar material engaging surface by means of a pair of obtuse angled exterior corners which are formed free of any sharp edges.

3,815,187
PROCESS FOR MAKING CERAMIC CAPACITORS
R. C. Frederick Hanold, III, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.
Filed July 12, 1972, Ser. No. 271,032
Int. Cl. H01g 13/00
U.S. Cl. 29—25.42 3 Claims



A method for making multilayered ceramic capacitors wherein an ink containing palladium oxide is used in the printing of electrode patterns on green ceramic sheet which is subsequently stacked and sintered.

3,815,188

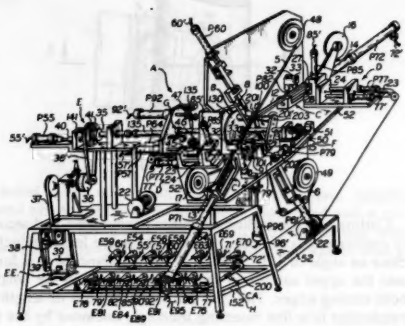
METHOD OF WINDING PLASTIC FILM CAPACITORS

Carlo San Pietro, Milan, Italy, assignor to Mial S.p.A., Milan, Italy

Continuation of Ser. No. 31,347, April 23, 1970, abandoned, which is a division of Ser. No. 619,448, Feb. 28, 1967, abandoned. This application Apr. 10, 1972, Ser. No. 242,873

Int. Cl. H01g 13/00

U.S. Cl. 29—25.42 7 Claims



A capacitor winding method includes forming a capacitor from a pair of dielectric bands and a pair of foil bands on a machine having a rotatable turret on which are slidably and rotatably mounted two pair of semi-mandrels on which capacitors are wound. Foil bands are automatically fed in interleaved relation with dielectric bands to form the capacitors. Terminals are automatically formed from wire and are welded to the foil.

3,815,189

CUTTING OR ABRADING ELEMENTS

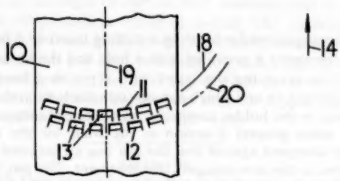
Edward David Russell, Rotherham, England, assignor to Stanley Tools Limited, Woodside, Sheffield, England

Filed July 24, 1972, Ser. No. 274,665

Claims priority, application Great Britain, July 23, 1971, 34621/71

Int. Cl. B23d 71/00; B21k 21/00

U.S. Cl. 29—78 7 Claims



A cutting and abrading element of sheet metal has a multiplicity of apertures in arcuate rows with several spaced-apart apertures in each row, the concave side of each row facing the direction of cut, trailing edges of the apertures protruding to form cutting edges. In one embodiment, the circle centres of the arcuate rows are on the longitudinal axis of the element and the space between each pair of apertures in each row is directly behind an aperture in an immediately preceding row and/or directly in front of an aperture in an immediately following row.

3,815,190

CUTTING OR ABRADING ELEMENTS

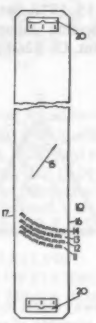
Edward David Russell, Rotherham, and George William Ronald Shelton, Dore, both of England, assignors to Stanley Tools Limited, Woodside, Sheffield, England

Filed July 24, 1972, Ser. No. 274,666

Claims priority, application Great Britain, Apr. 20, 1972, 18447/72

Int. Cl. B23d 71/00; B21k 21/00

U.S. Cl. 29—78 5 Claims



A cutting and abrading element of sheet metal has a multiplicity of apertures in arcuate rows with several spaced-apart apertures in each row, the concave side of each row facing the direction of cut, trailing edges of the apertures protruding to form cutting edges. The circle centres are all to one side of the axis, the cutting edges near that side of the element extending transversely of the axis, with the cutting edges of one row laterally staggered relative to the cutting edges of another row, whilst the cutting edges near the other side of the element are directly one behind another and at obtuse angles to the axis, to produce different cutting and abrasing effects from one side of the element than the other.

3,815,191

CHIP-FORMING CUTTING TOOL

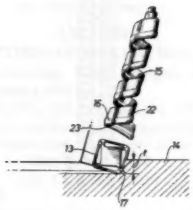
Johan Edvin Holma, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed July 3, 1972, Ser. No. 268,690

Claims priority, application Sweden, July 7, 1971, 8780/71

Int. Cl. B26d 1/00

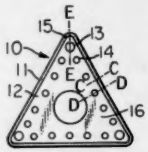
U.S. Cl. 29—95 R 5 Claims



In a chip-forming machining operation improved results accrue from imparting to the chip — in the course of its formation — a longitudinally extending bulge or thickened portion which significantly stiffens the chip and desirably modifies its form. Locating the bulge adjacent the central part of the chip influences a ring-shaped form of chip, while locating the bulge adjacent an edge of the chip results in a cylindrical form of

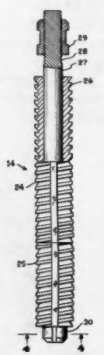
chip having a fairly constant radius of curvature and a great relatively constant pitch. The cutting tool which provides this stiffened chip has a groove or concavity at the locus where the thickened portion of the chip is desired.

3,815,192
THROW AWAY INSERT
Yasuo Ohtsu; Seiji Nakatani, and Hiroshi Fukura, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Feb. 15, 1973, Ser. No. 332,729
Claims priority, application Japan, Feb. 26, 1972, 47-23720
Int. Cl. B26d 1/00
U.S. Cl. 29—95 R 10 Claims



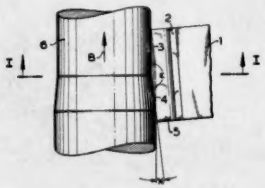
A polygonal throw away insert to be detachably mounted in a tool holder having a plurality of cutting edges on one major surface of the insert body along the edges of all the sides thereof and a plurality of projection rows provided on said major surface along and spaced from the cutting edges so as to form chip breakers. Adjacent projections in each projection row define chip curling zones therebetween.

3,815,193
BROACHING TOOL
Earl K. Moore, Jr., Box 2486, Odessa, Tex. 79760
Filed Feb. 14, 1973, Ser. No. 332,394
Int. Cl. B26d 1/04
U.S. Cl. 29—95.1 6 Claims



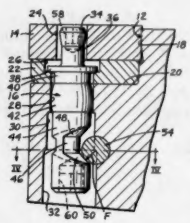
A broaching tool for correcting the inside diameter (i.d.) of irregular tubing, and arranged to be driven downhole and uphole by a mechanical jar, comprising a mandrel having spaced stops thereon with a plurality of cutting spools reciprocatingly received in a slidable manner upon the mandrel. Each spool has a circumferentially extending cutting blade made into the form of a spiral, and is further provided with radially spaced longitudinally extending elongated slots for maintaining the blade free of cuttings.

3,815,194
CUTTING TOOL FOR PEELING MACHINES
Alfons Gofke, Solingen, Germany, assignor to The Kieserling & Albrecht, Solingen, Germany
Filed Sept. 22, 1972, Ser. No. 291,267
Claims priority, application Germany, Sept. 28, 1971, 2148318
Int. Cl. B26d 1/00
U.S. Cl. 29—96 4 Claims



Cutting tool for peeling machines having main and secondary cutting edges of approximately the same length which enclose an angle of 170° to 178°. A chip-guidance step is formed into the upper surface of the cutting tool along the length of both cutting edges. The chip-guidance step has its length perpendicular to a line bisecting the angle enclosed by the main and secondary cutting edges.

3,815,195
ARRANGEMENT FOR LOCATING CUTTING INSERT IN HOLDER
James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed May 24, 1973, Ser. No. 363,602
Int. Cl. B26d 1/00
U.S. Cl. 29—96 11 Claims

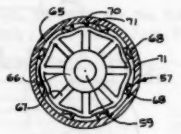


An arrangement for locating a cutting insert in a holder in which the insert is provided with a hole and the holder has a pocket for receiving the insert with a pin in a bore in the holder having an end which extends into the hole in the insert. The bore in the holder comprises an abutment surface facing in the same general direction as the walls for the insert is thereby clamped against and the pin has an inclined surface eccentric to the axis engaging the abutment. The pin, furthermore, has a region between the abutment and the pocket in which the insert is mounted which fits closely in the bore in the holder. The arrangement provides that rotation of the pin in the bore in the holder will cause the interaction between the abutment and the aforementioned surface on the pin to tilt the end of the pin disposed in the hole in the insert back toward the surfaces against which the insert is to be located thereby pressing the insert firmly against the surfaces. The inclined surface on the pin is inclined in such a direction that the force exerted on the pin by the abutment is inclined in the downward direction whereby simultaneously with locating the insert against the aforementioned surfaces, the pin is drawn downwardly.

3,815,196
ROLLER HAVING A SHEET METAL SLEEVE AND INSERTED BEARINGS

Robert W. Gotham, 10 Cranmoor Dr., Toms River, N.J.; Robert J. McKnight, Jamestowne Village, Bldg. 10, Apt. 5, Freehold, N.J. 08753, and Frank J. Neuwirth, 1210 Ivy Rd., Manasquan, N.J.

Filed Jan. 4, 1973, Ser. No. 320,949
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 R 4 Claims



A metal roller with plastic bearings which have radially disposed ribs to resiliently hold them in place, and with a circular rib outstanding from the bearing so that contact with axle-supporting rail is reduced to a circular line rather than a plane surface.

3,815,197
GLASS LEHR ROLL AND METHOD OF MANUFACTURE

Robert J. Sukenik, Bloomfield Hills, Mich., assignor to New Hudson Corporation, New Hudson, Mich.

Filed Nov. 8, 1972, Ser. No. 304,606
Int. Cl. B21b *31/08*
U.S. Cl. 29—132 24 Claims

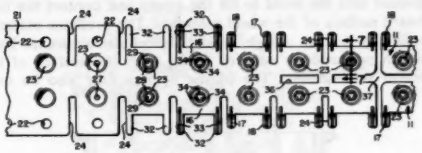
A construction and method of manufacture for flat glass annealing lehr rolls having a metal body and a covering of insulating material made from glass, ceramic or metallic fibers. Among the glass and ceramic fibers are amorphous silica, amorphous graphite, ceramic fibers such as "Kaowool" or "Fiberfrax," quartz or mineral wool, metallic fibers, fibermetal or porous metal might be carbon steel, stainless steel or other metals, or alloys such as nickel or bronze. The covering is a temperature-resistant material which is flexible and resilient at lehr temperatures and has a relatively low radial coefficient of thermal conductivity. The covering is relatively thin in most embodiments of the invention, and may be slipped on as a sleeve or applied and secured in other ways.

3,815,198
METHOD FOR MANUFACTURING PEGBOARD HOOKS

David R. Thalenfeld, 164-41 Powell's Cove Blvd., Beachurst, N.Y. 11357

Division of Ser. No. 62,271, Aug. 10, 1970, Pat. No. 3,724,792. This application Dec. 27, 1972, Ser. No. 319,041
Int. Cl. B23p *13/00*, *17/00*
U.S. Cl. 29—150 8 Claims

The invention relates to a method of manufacturing new peg board display hook. The new hook is characterized particularly by the construction of its principal components, a base member and a hook member, and the manner in which these two components are secured together. The base member is stamped and formed of sheet or strip metal stock to provide a cylindrical walled opening. The base member is given a surface plating treatment subsequent to its formation but prior to assembly with the hook member. The hook member is formed of pre-plated wire stock, which is cut to length, shouldered and headed, and then inserted into the walled opening of the



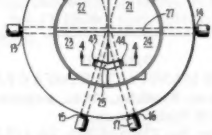
base member. The base and hook members are then locked together by mechanical deformation of one or both parts.

The new constructional technique enables extra-ordinary reductions in manufacturing cost to be realized while, at the same time, providing an end product which is actually far superior to the conventional product.

3,815,199
MANUFACTURE OF FLUIDIC ELEMENTS

Arthur Malavazos, 28504 Mission Blvd., No. 942, Hayward, Calif. 94545

Filed Jan. 19, 1973, Ser. No. 325,191
Int. Cl. F15c *5/00*
U.S. Cl. 29—157 R 5 Claims



Fluidic elements are formed of pie-shaped segments in which the major ducts are formed in the edge of the pie-shaped segments. The ducts can be formed by milling, coining, stamping or molding, since their depth is normally one-fourth that of their width. The respective segments are assembled into a circular plate and inserted in a suitable containing structure.

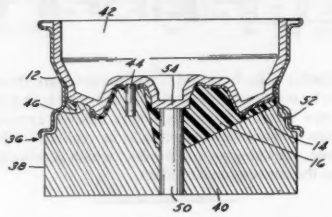
3,815,200
METHOD OF MAKING MOLD

Leslie R. Adams, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 189,116, Oct. 14, 1971, Pat. No. 3,762,677, which is a continuation-in-part of Ser. No. 857,960, Sept. 15, 1969, abandoned. This application June 29, 1973, Ser. No. 374,884
Int. Cl. B21d *53/26*
U.S. Cl. 29—159 A 5 Claims

Apparatus for molding a composite styled wheel for use on automotive passenger vehicles and the like, a method of constructing such a wheel employing the molding apparatus and a method of constructing such molding apparatus, wherein a portion of the mold comprises a conventional metal vehicle wheel having a drop center rim secured to a central disc or body having the usual bolt circle holes and a central aperture so that the disc can be mounted on an axle, drum or disc brake assembly. The metal wheel is employed in conjunction with an upper back-up clamp and lower mold part to define therewith

a sealed cavity for molding and attaching a three-dimensional contoured plastic overlay, the overlay thus being molded in situ and permanently attached to the outboard side of the wheel in the mold apparatus. Preferably, the wheel forms the upper surface of the mold cavity and a reaction mixture of a urethane elastomer liquid adhesive material is injected or poured into the mold to fill the cavity and contact the outboard surface of the wheel assembly. The urethane material solidifies to form a high density noncellular elastomer body which permanently adheres to the outboard surface of the wheel subassembly. The plastic overlay may also be constructed from a lower density microcellular closed cell urethane elastomer adhesive material. The urethane material is allowed to solidify in the mold cavity and then the mold is opened so that the wheel with the overlay securely adhered to it may be removed from the mold. The overlay may then be painted or otherwise covered with a decorative coating to provide a finished metallic-appearing ornamental wheel. The urethane elastomer thus forms a plastic body having a three-dimensional contour which is permanently attached to the outboard side of the wheel to provide a decorative surface, and the elastomer overlay appears to be an integral portion of the metal wheel.



3,815,201

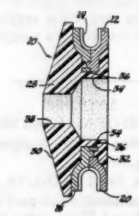
METHOD FOR MANUFACTURING A GEAR WHEEL

Winthrop B. Conrad, Franklin, Mich., assignor to Teleflex Incorporated, North Wales, Pa.

Division of Ser. No. 228,028, Feb. 22, 1972, Pat. No. 3,772,936. This application June 18, 1973, Ser. No. 370,751

Int. Cl. B21d *53/28*; **B23p** *15/14*; **B21h** *5/00*; **B21k** *1/30*

U.S. Cl. 29—159.2 **6 Claims**



This disclosure relates to a gear wheel and method for making the same which is used in an assembly including a flexible motion transmitting core element utilized to transmit motion in a curved path. The gear wheel includes a circular metal wheel comprised of two substantially identical metal halves mated together to define a peripheral groove with helical teeth disposed therein for engaging helical windings on the core element and a plastic hub portion molded partially about the circular metal wheel including an axial bore therethrough for receiving a support member or drive shaft.

3,815,202

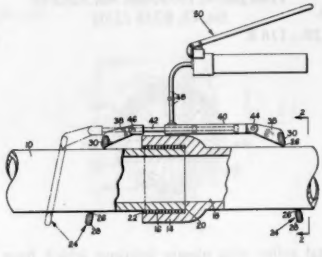
PIPE JOINER

Jack E. Squires, P.O. Box 495, McMinnville, Oreg. 97128

Filed Sept. 14, 1972, Ser. No. 289,007

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 P **6 Claims**



A pair of C-shaped clamps are interconnected pivotally in spaced-apart relation by an extensible and retractable hydraulic piston cylinder unit. The clamps are laid over a pair of pipes to be joined, one on each side of the joint, and the piston-cylinder unit operated from a remote position in the direction to shorten its length, whereupon the clamps are caused to grip the pipes and pull them together into sealed connection at the joint.

3,815,203

APPARATUS FOR APPLYING FINS TO STATIONARILY HELD PIPES BY MEANS OF ENTRAINMENT MEMBERS

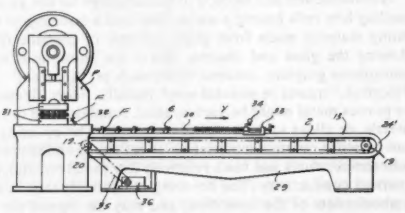
Heinrich Schulenberg, Bochum, and Gunter Seien, Wanne-Eickel, both of Germany, assignors to Gea Luftkuhler gesellschaft Happel GmbH & Co., KG, Bochum, Germany

Filed Aug. 7, 1972, Ser. No. 278,616

Claims priority, application Germany, Aug. 6, 1971, 2139382

Int. Cl. B23p *15/26*

U.S. Cl. 29—202 R **13 Claims**



Apparatus for applying fins onto stationary held pipes by means of endless transporting means on which a plurality of plate-shaped parallel entrainment members are mounted each tiltable between a working position extending substantially normal to the pipes and a releasing position. The entrainment members are each provided with at least one glide shoe which during the part of the movement of the entrainment members in which the same moves the fins onto the pipes abuts against support members of an endless chain having a working run adjacent and parallel to that of the endless transporting means and moving in a direction opposite thereto to hold the entrainment members in their working position. After leaving the last of the supporting members on the chain, the entrainment members will automatically tilt to their releasing position. The apparatus further includes restoring means for moving the en-

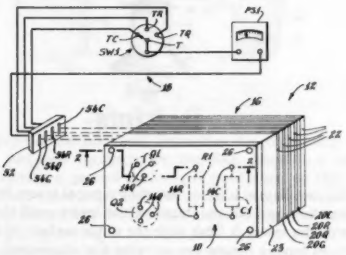
trainment members from the releasing position back to the working position during movement of the portion of the endless transporting means carrying the respective member from the idle run to the working run.

3,815,204

APPARATUS AND METHOD FOR SELECTIVELY BACKLIGHTING PRINTED CIRCUIT BOARD PERFORATIONS TO ACCURATELY LOCATE ELECTRICAL COMPONENT LEADS THEREIN

Gustav Feldman, 18 Prospect Ave., Bldg. C, Norwalk, Conn. 06851

Filed Feb. 26, 1973, Ser. No. 336,101
Int. Cl. H05k *13/04*; **B23q** *17/00*; **H05k** *3/30*
U.S. Cl. 29—203 B **11 Claims**



A component locating apparatus, of the type arranged to selectively backlight different groups of component lead receiving perforations in a printed circuit board or harness wiring board, includes an improved backlighting apparatus with a multilayer board formed from a plurality of conductive layers, insulated from one another. A layer is provided for each group of perforations to be simultaneously backlighted, and the multilayer board has openings therethrough corresponding to and registerable with the perforations in the printed circuit board. Mounted in each opening is a light source element having an electrical contact arranged to contact the conductive layer which corresponds to the group of perforations which includes the perforation opposite that opening. A power source and switch complete a circuit through selected ones of the conductive layers and the light source elements in contact therewith, thus causing the light source elements to emit light and thereby backlight the respective groups of perforations.

The method of constructing such a backlighting apparatus entails assembling the multilayer board from a plurality of conductive layers insulated from one another, and then forming openings in said layers corresponding to and registerable with the perforations in the printed circuit board. The plurality of light source elements, each having an electrical contact arranged to contact a selected one of said conductive layers, are mounted in said openings so that the the appropriate conductive layer for the group including that opening is contacted. Finally, electrical circuit means are connected to said conductive layers to permit the light source elements to be energized to individually backlight the groups of the perforations.

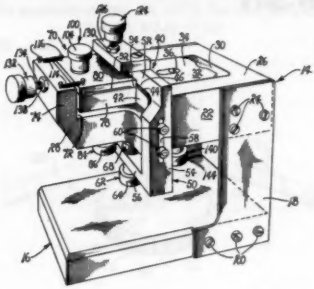
3,815,205

DEVICE FOR CONFIGURING MULTIPLE LEADS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Paul W. Clemons, Paint Rock, Ala.

Filed Mar. 2, 1973, Ser. No. 337,487
Int. Cl. H01r *43/00*; **H05k** *3/32*
U.S. Cl. 29—203 MW **14 Claims**

A device for simultaneously configuring multiple leads projected from a printed circuit affixed to a circuit board. The device is characterized by a receptacle adapted to receive and support a circuit board having multiple leads projected therefrom, a first locking mechanism for securing the base portion of the leads against motion relative to the circuit board and a second locking mechanism, spaced from the



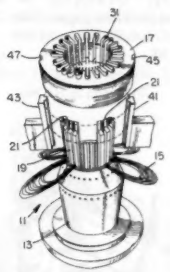
receptacle and mounted on a carriage for securing the distal end portions of the leads relative to the carriage. The carriage, in turn, is supported for a simultaneous motion in vertical and horizontal planes for imparting selective motion to the carriage, whereby leads secured by said locking mechanisms are deformed to a preselected configuration.

3,815,206

WIRE PROTECTING COIL PLACING METHOD AND APPARATUS

Dallas F. Smith, Fort Wayne, Ind., assignor to General Electric Corporation, Ft. Wayne, Ind.

Filed Dec. 4, 1972, Ser. No. 311,769
Int. Cl. H02k *15/06*; **H01f** *7/06*
U.S. Cl. 29—205 D **14 Claims**



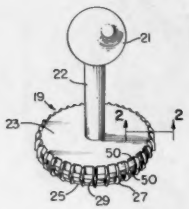
Method and apparatus for inserting prewound coils into stator core slots is disclosed including a plurality of simultaneously movable elongated thin-walled members adapted to overlie or cover the saw tooth surfaces presented by the sides of stator teeth and to be slideable on a wedge guide configured to approximately correspond to, or be slightly larger in profile than, a stator tooth. Thin-walled members extend through and at least slightly beyond the stator for the subsequent movement of prewound coils along the members and into selected stator slots while being protected from rough surfaces by the members. Prewound coils may be placed between selected ones of the elongated members, a stator positioned at the free extremity of the elongated members, the elongated members moved through the stator, and the coils moved along the elongated members and into stator slots.

3,815,207

MEANS FOR ALIGNING COIL INJECTION TOOLING WITH A STATOR CORE

Richard J. Habegger, Grabill, Ind., assignor to General Electric Company, Ft. Wayne, Ind.

Filed Dec. 4, 1972, Ser. No. 311,770
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 R 5 Claims



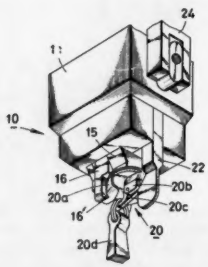
Method and apparatus for inserting prewound coils into stator core slots is disclosed comprising a plurality of movable elongated thin-walled members each adapted to fit around a stator tooth and slide there along so as to extend beyond the stator and allow the subsequent movement of coils along the members and into selected stator slots and a peripherally serrated tool for aligning a stator core with the elongated members so that prewound coils may be placed over selected ones of the elongated members, the alignment tool placed thereon, the stator passed over the alignment tool onto the members and the coils subsequently inserted into stator slots.

3,815,208

SLIDER HOLDER FOR CONCEALED FASTENER CHAIN

Koichi Kawakami, Toyama, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1973, Ser. No. 361,144
Claims priority, application Japan, May 22, 1972, 47-51004
Int. Cl. B23p *19/04*
U.S. Cl. 29—207.5 SL 5 Claims



A slider holder for assembling sliders on a concealed slide fastener chain is provided with structural features designed to accept sliders of different types and sizes without having to change the slider receptacle parts. A pair of spring-loaded clamping means are provided for clamping the slider into position in cooperation with a stationary retaining bar with other parts of the device disposed clear of the path of the fastener chain to facilitate the assembling operation.

3,815,209

INSTALLATION TOOL FOR FLUSH MOUNTED INSERTS

Peter A. Basile, Edison, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed May 22, 1973, Ser. No. 362,769
Int. Cl. B23p *19/04*; B25b *13/00*
U.S. Cl. 29—240 17 Claims

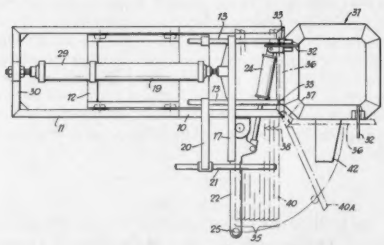
An installation tool for inserting a panel insert into a panel by rotation and advancement of the insert until the working face of the insert is flush with the outer surface of the panel, the tool having means for assisting the attainment of such a flush relationship and indicating means for signalling the arrival of the working face of the insert in flush relationship with the outer surface of the panel.

3,815,210

METHODS OF AND APPARATUS FOR LOADING AUTOMATIC HOT TOPPING APPARATUS WITH HOT TOPPING SLABS

Kenneth Thomas Eccleston, and John George Frizzell, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

Filed June 7, 1972, Ser. No. 260,438
Claims priority, application Great Britain, June 16, 1971, 28242/71
Int. Cl. B23p *19/04*
U.S. Cl. 29—252 3 Claims



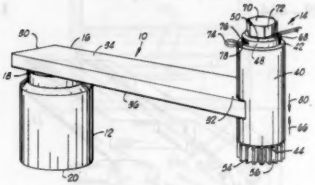
Apparatus for loading hot topping slabs onto a device for placing them in an ingot mold includes a base, a moveable slab carrier and means for locating the base and device to allow transfer of a slab from the slab carrier on to the hot topping device.

3,815,211

METHOD AND APPARATUS FOR REMOVING AND TIGHTENING NUT-TYPE FASTENERS OR THE LIKE

John C. Acord, IV, 706 N. Elbson, Oklahoma City, Okla. 73106

Filed Dec. 18, 1972, Ser. No. 316,106
Int. Cl. B23p 19/02
U.S. Cl. 29—427 11 Claims



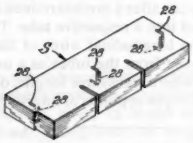
An improved method and apparatus for tightening and removing nut-type fasteners or the like wherein a guide member, having a geared surface, is positioned so that the geared surface surrounds the fastener and a torque wrench apparatus is connected to the fastener and to the geared surface for rotatingly tightening or removing the fastener, the torque wrench apparatus basically comprising: a socket head removably engageable with the fastener, a drive member having gear teeth formed about a portion thereof, a connecting bar connecting the socket head and the drive member in a predetermined spaced relationship, the drive member being journally supported via the connecting bar; and a drive assembly connectable with the drive member for rotatingly driving the drive member, the drive member moving along the geared surface of the guide member and rotatingly tightening or removing the fastener via the interconnecting connecting bar as the drive member is rotatingly driven via the drive assembly. In one aspect, the method and the apparatus of the present invention are particularly useful for removing and tightening the gland nut connecting a flywheel to a crankshaft of an automobile engine.

3,815,212

METHOD OF SECURING TOGETHER A STACK OF ROOFING SHINGLES

Ernst G. Breckenfelder, 2020 Estes Ave., Elk Grove Village, Elmhurst, Ill. 60007

Division of Ser. No. 167,727, July 30, 1971, Pat. No. 3,735,909. This application Mar. 16, 1973, Ser. No. 341,970
Int. Cl. B23p 11/06
U.S. Cl. 29—432.1 4 Claims



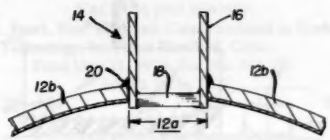
An improved automatic nailing apparatus having means for feeding a length of wire, bending the wire to form an L-shaped nail, severing the nail thus formed from the remaining length of wire, and driving the nail into an object to be nailed, such object being for example a bundle of roofing shingles to be bound together.

3,815,213

METHOD OF MAKING AN IMPROVED SLOT DRAINAGE CULVERT

Ralph E. Evans, Middletown, Ohio, and Howard E. Blower, Oakland, Calif., assignors to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 60,516, Aug. 3, 1970, Pat. No. 3,714,786. This application Nov. 16, 1972, Ser. No. 307,137
Int. Cl. B23p 11/02
U.S. Cl. 29—446 7 Claims



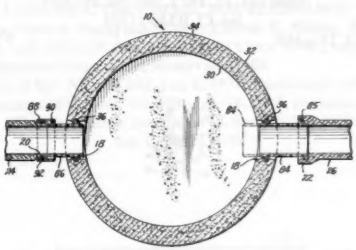
An open slot culvert for positioning in a drainage area with the open slot at the top so that any surface drainage water will flow through the slot and directly into the culvert, including a method and apparatus for its manufacture. The improved open slot culvert comprises a metallic, pipe section, split longitudinally along its upper side to form a narrow slot, and grate means, including two spaced, vertical bearing members joined by spacer means, secured in the slot. The method of making the improved open slot culvert includes the steps of providing two elongated, parallel, vertical members in spaced relation having a plurality of spacer means therebetween, longitudinally splitting the upper side of a metallic pipe section to form a narrow slot, and properly positioning the grate means within the narrow slot. The apparatus for making the improved open slot culvert generally comprises an entry pipe station, a pipe clamp, saw and tack welding station, and a finish welding and exit station.

3,815,214

METHOD FOR CONNECTING PIPE TO A MANHOLE

John V. Kyle, Sr., 4 LaVista - Perimeter Office Pk., Suite 144, Tucker, Ga. 30084

Filed May 22, 1972, Ser. No. 255,714
Int. Cl. B23p 11/02
U.S. Cl. 29—450 8 Claims

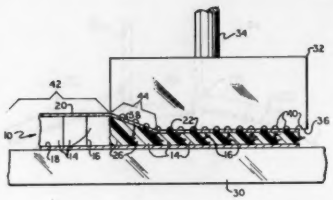


A manhole is provided with a precast opening of precise dimensions and has a resilient O-ring gasket cast in situ medially thereof. A sewer pipe is fitted with a connector section on the end thereof, said section having a smooth cylindrical exterior of substantially uniform diameter. The connector section is receivable in the manhole connector opening, and the arrangement and method allow latitude to the location of the manhole while providing a flexible but tightly sealed joint.

3,815,215
METHOD OF FORMING A HONEYCOMB STRUCTURAL PANEL

George E. Medawar, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 6, 1972, Ser. No. 295,459
Int. Cl. B23p *3/00, 19/04*
U.S. Cl. 29—460 6 Claims



A honeycomb structural panel has a first portion of original manufactured thickness and a second portion, integral therewith, of substantially less thickness. In the first portion, the core cell walls are straight from end to end and parallel with each other. In the second portion, the cell walls are axially crushed and distorted so that their overall lengths are less than their original lengths. The crushed cell walls are much weaker than the others. Therefore, these cells are filled with plastic cured to a rigid state. Since all of the walls are confined in the plastic, they can no longer distort, and the combination of cells and plastic is adequate for the imposed loads. The method involved consists in forming apertures in a selected portion of one facing sheet, with at least one aperture communicating with each cell, filling the cells through the apertures with a liquid filler, pressing the facing sheets together to crush the cell walls while extruding excess filler through the apertures, and then curing the filler in place to a rigid state to reinforce the crushed cells.

3,815,216
METHOD OF MANUFACTURING A THERMAL BREAK CONSTRUCTION ELEMENT

Warren H. Brockway, Newnan, and Eugene J. Craven, Moreland, both of Ga., assignors to The William L. Bonnell Company, Newnan, Ga.

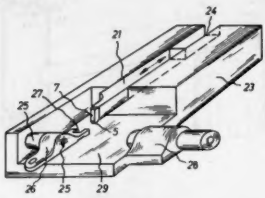
Filed Oct. 12, 1972, Ser. No. 297,057
Int. Cl. B23p *11/00*
U.S. Cl. 29—460 5 Claims

A method of manufacturing a combination metal and plastic linear construction element or shape, wherein in a continuous operation, a metal extrusion is made containing a removable section, the removable section is removed while the remainder of the extrusion is held in place substantially as originally extruded, and a plastic thermal break is extruded and inserted in the metal extrusion, thereby forming a unitary or integral linear shape comprising two metal members and a plastic member, with the plastic member retaining the metal members in spaced apart relationship and forming an insulating barrier or thermal break between the metal elements.

3,815,217
METHOD OF AND APPARATUS FOR ACCURATELY MOUNTING BITS IN ENGRAVING TOOLS FOR ELECTRONIC PRINTING FORM ENGRAVING MACHINES

Walter Baar, Kiel, Germany, assignor to Dr. Ing. Rudolf Hell GmbH

Filed Mar. 16, 1973, Ser. No. 342,209
Claims priority, application Germany, Mar. 22, 1972, 2213768
Int. Cl. B23q *3/00*
U.S. Cl. 29—464 14 Claims

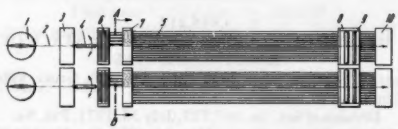


A preground engraving tool bit is first accurately positioned relative to a mounting member, then secured to the mounting member for handling, and with the aid of the mounting member finally operationally united with a tool holder. All this is accomplished with extreme accuracy in a simple, efficient device especially devised for making such engraving tools for electronic printing form engraving machines.

3,815,218
METHOD FOR PRODUCTION OF CONCRETE REINFORCEMENT LATTICE MATS

Oskar Palmer, Rembrandtstrasse 25, 4 Dusseldorf, Germany

Division of Ser. No. 252,477, May 11, 1972, Pat. No. 3,779,445. This application Sept. 6, 1973, Ser. No. 394,719
Claims priority, application Germany, May 12, 1971, 2123501
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.3 6 Claims



A method and apparatus for forming wire mats for reinforced concrete in which wire is drawn from a reel and successively directed to parallel, adjacent support tubes, the wire being successively cut after a predetermined length of the wire has been deposited into a respective tube. The cut lengths of wire constitute the longitudinal wires of the mat, and these lengths are advanced from the tubes as a unit and fed into a welding machine where transverse lengths of wire are welded to the longitudinal wires at points of intersection.

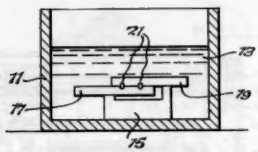
3,815,219
PROCESS FOR DIFFUSION BONDING

Wendell B. Wilson, Spruce Dr., Rt. 2, Granville, Ohio 43023

Filed Mar. 30, 1971, Ser. No. 129,406
Int. Cl. B23k *1/20, 31/02*
U.S. Cl. 29—488 4 Claims

A process for diffusion bonding of metal parts (including particles) by immersion of the metal parts, or at least those portions thereof to be joined together, in a non-metallic, inor-

ganic melt while the parts are in intimate contact, heating them to a temperature at which diffusion of the metal atoms at the surfaces of one or more of the parts takes place, and maintaining said heating for a period of time sufficient to provide a satisfactory bond. The melt, which may consist of a molten glass, one or more molten oxides, or one or more fused salts, protects the metal surfaces from oxidation and in many cases

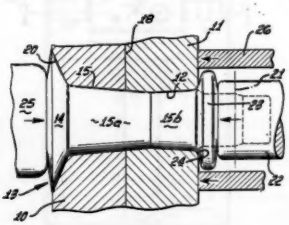


serves as a flux to dissolve surface films from the metal parts. It may also serve concurrently as a heat-treating bath. Pressure can be applied to immersed metal parts to improve the intimacy of their contact and two or more parts, after heating in the melt, may be withdrawn and while coated with and protected by the melt may be pressed, rolled or otherwise mechanically treated to improve the inter-metal contact and then reimmersed in the melt for further heating.

3,815,220
METHOD OF CONNECTING A RIVET TO WORK STRUCTURE

Franklin S. Briles, No. 6 Middle Ridge Ln., Rolling Hills, Calif. 90274

Division of Ser. No. 20,220, March 17, 1970, Pat. No. 3,680,429. This application July 21, 1972, Ser. No. 273,740
Int. Cl. B21d *39/00*; **B23p** *11/00*
U.S. Cl. 29—509 **4 Claims**



A self-gauging, interference fit rivet, comprises:

a. a head and a shank protruding therefrom,

b. the shank having, along its length in a direction away from the head, a sequence of progressively reduced diameter sections, the smallest section to fit freely within a work bore and the largest section to resist complete insertion of the rivet in the bore by interference engagement with the work surrounding the bore,

c. there being an elongated mid-section between said largest and smallest sections for centering the rivet in the bore through slight interference therewith,

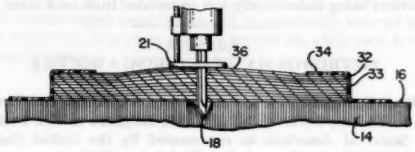
d. said shank largest section being capable of forced insertion relatively into the bore to enable closure of the head toward the work and to pre-stress the work around the bore, and

e. said smallest section of the rivet being sized to be upset for forming a retaining flange at the side of the work opposite the head.

3,815,221
METHOD FOR HOLDING SHEET MATERIAL BY A VACUUM HOLDDOWN

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed May 21, 1973, Ser. No. 362,187
Int. Cl. B23q *7/00*
U.S. Cl. 29—559 **5 Claims**



A method is disclosed for holding relatively stiff sheet material such as denim while it is being worked upon in a multi-ply layup on a supporting surface. The top ply of the layup is covered along its peripheral region by an air-impervious material extending from the supporting surface adjacent the side of the layup up to the top ply at its periphery. The central region of the top ply within the covered peripheral region is left uncovered and exposed to the ambient air. A vacuum is generated between the air-impervious material and the sheet material of the layup. This vacuum produces forces across the air-impervious material to compress the layup against the supporting surface thereby holding the layup in place.

3,815,222
SEMICONDUCTOR STRUCTURE AND METHOD FOR LOWERING THE COLLECTOR RESISTANCE

Hajime Mitarai, Sunnyvale, Calif.; Carroll E. Nelson, Dallas, Tex., and Albert P. Youmans, Santa Clara, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

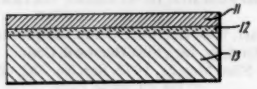
Division of Ser. No. 104,240, Jan. 6, 1971, abandoned, which is a continuation of Ser. No. 791,658, Jan. 16, 1969, abandoned.
This application Jan. 31, 1972, Ser. No. 222,357
Int. Cl. B01j *17/00*
U.S. Cl. 29—578 **1 Claim**

Semiconductor structure and method for lowering the collector resistance in dielectrically isolated integrated circuits by providing a heavily doped layer which extends across the collector bed and to the surface of the structure.

3,815,223
METHOD FOR MAKING SEMICONDUCTOR STRUCTURE WITH DIELECTRIC AND AIR ISOLATION

David F. Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Division of Ser. No. 113,628, Feb. 8, 1971, Pat. No. 3,660,732, which is a continuation of Ser. No. 776,427, Nov. 18, 1968, abandoned. This application Jan. 26, 1972, Ser. No. 220,846
Int. Cl. B01j 17/00
U.S. Cl. 29—583 3 Claims

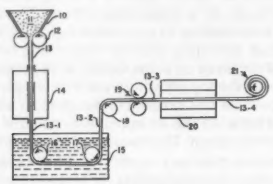


Method for making semiconductor structure having devices formed in a very thin layer of monocrystalline silicon with the devices being dielectrically and air isolated from each other.

3,815,224
METHOD OF MANUFACTURING A DUCTILE SUPERCONDUCTIVE MATERIAL

Milton R. Pickus; Earl R. Parker, both of Oakland, and Victor F. Zackay, Berkeley, all of Calif., assignors to The United States of American as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed June 8, 1971, Ser. No. 151,111
Int. Cl. H01v 11/00; B22f 3/24
U.S. Cl. 29—599 13 Claims



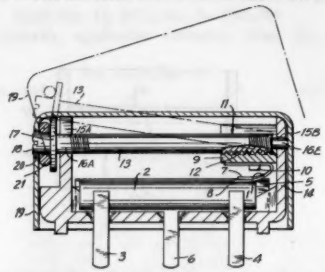
A ductile superconductive material and method for manufacturing same, which basically may utilize any porous metal or its hydride with a melting point substantially higher than that of the infiltrating metal that will form a superconductive compound when reacted with the infiltrating metal. The superconductive material is made from a porous strip or tape of niobium or vanadium for example, infiltrated with tin, aluminum, antimony, antiomony, or gallium, for example, and treated in a manner so as to contain interconnecting filaments of the superconducting phase Nb_3Sn, Nb_3Al, $Nb_3(Al,Ge)$, Nb_3Sb, or V_3Ga, for example. The novel manufacturing process, which is relatively simple and inexpensive provides a method of producing a new and useful end product capable of a broad superconductive range due to the amount of reaction of the infiltrated material with the porous material. The novel process may be utilized in either batch or continuous operational applications.

3,815,225
METHOD OF MAKING AN ADJUSTABLE ELECTRICAL COMPONENT

Trevor Frank John Gooding, Guildford, and Geoffrey David Stuart Howse, Farnborough, both of England, assignors to Electrosil Limited, Pallion, Sunderland, England

Division of Ser. No. 192,385, Oct. 26, 1971, Pat. No. 3,735,326. This application Dec. 18, 1972, Ser. No. 316,297
Int. Cl. H01c 1/02, 17/00
U.S. Cl. 29—613 3 Claims

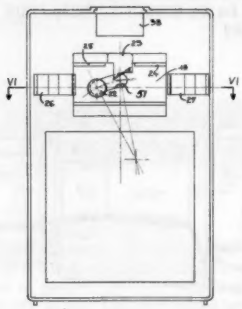
A method of making an adjustable electrical component having a casing, through an aperture in which is accessible a lead screw member by which the component can be adjusted. The method includes the provision of two support portions one defining a hole and the other a recess having an open side and disposing an end region of the lead screw member in said hole. The other end region of the lead screw member is engaged in the aperture of the casing so that the lead screw member is at an angle to its operating position. There is then effected the relative moving of the casing and the support portions to place the support portions within the casing and to pivot said adjusting member to its operating position in the recess.



3,815,226
AUTOMATIC CAN OPENER WITH CAN DISENGAGEMENT THROUGH MOTOR REVERSAL

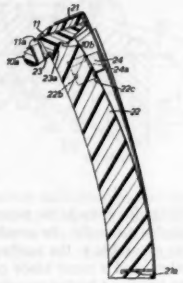
Paul Marrie, Dijon, France, assignor to Societe Etud, Quetigny, France

Filed Feb. 14, 1972, Ser. No. 225,935
Claims priority, application France, Apr. 7, 1971, 71.12243
Int. Cl. B67b 7/38
U.S. Cl. 30—4 R 9 Claims



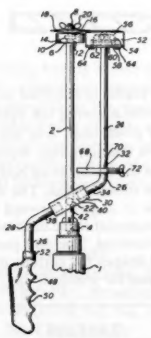
Device for automatic opening of cans which includes a swinging arm upon which a rotating knurl is mounted for engaging the can against a cutter blade. The arm pivots around a stationary axle on the casing and carries the shaft at the end of which is fixed the knurl, the movement of this arm being controlled by a motor, a gear-work with reversing mechanism movable by a switch and a cam pivoting on a stop, so that the shaft of the knurl makes a round trip along a rise formed by an inclined and elongated opening on the removable cutting head. The lid of the can is thus automatically perforated and cut, and the can then turns in response to the mechanism actuation of reversing to free it when the knurl has returned to its rest position.

3,815,227
HOLDERS FOR RAZOR BLADES
Christopher J. Hood, Tolworth, England, assignor to Wilkinson Sword Limited, London, England
Filed May 18, 1972, Ser. No. 254,739
Claims priority, application Great Britain, May 20, 1971, 16059/71
Int. Cl. B26b *21/16, 5/00*
U.S. Cl. 30—64 4 Claims



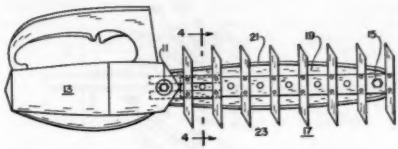
A holder for a razor blade of the kind which is secured in a permanent manner to a substantially rigid member, has a fixed projection or recess which, when the razor blade is located in the holder, engages a recess or projection of the rigid member, and a resilient member adapted normally to retain the fixed projection or recess in engagement with the recess or projection of the rigid member, the razor blade being released from the holder by pressure on the rigid member which, by reaction between the fixed projection or recess and the projection or recess of the rigid member, overcomes the retaining action of the resilient member.

3,815,228
SHEET METAL CUTTING DEVICE
Louis DeSantis, 15 Shaker Ridge Ln., Commack, N.Y. 11725
Filed Nov. 6, 1972, Ser. No. 304,147
Int. Cl. B26b *25/00*
U.S. Cl. 30—124 8 Claims



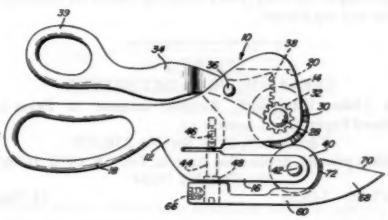
A cutting tool for cutting sheet metal especially sheet metal ducts. The tool has two interconnected pivoted arms, one of said arms is motor driven and has a rotary cutting blade and a circular rotary holding member connected to its outer end. The other arm has another circular holding member on its end positioned so that it bears against the first rotary member when the arms are pivoted together to hold the sheet metal while it is being cut.

3,815,229
HEDGE TRIMMER ATTACHMENT FOR A CHAIN SAW
Elof Granberg, 530 Canal St. 1a, San Rafael, Calif. 94901
Filed Oct. 9, 1970, Ser. No. 79,449
Int. Cl. B27b *17/02*
U.S. Cl. 30—388 4 Claims



A double-edged comb which can be removably secured to the cutter bar of a chain saw to convert the chain saw to a hedge trimmer.

3,815,230
ROTARY SHEAR WITH PICKUP FINGER AND PRESSURE RELEASE
Berkeley J. Florian, 1500 Florian Dr., Dania, Fla. 33004
Filed Oct. 5, 1972, Ser. No. 295,193
Int. Cl. B26b *17/04*
U.S. Cl. 30—178 5 Claims

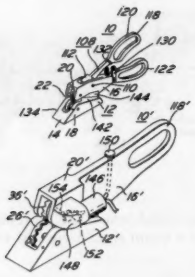


An elongated handle having first and second spaced jaws at one end and rotary anvil structure and rotary cutting disk structure journaled from the first and second jaws. The rotary cutting disk structure is disposed closely adjacent but slightly spaced from the rotary anvil structure for rolling engagement with the latter upon the spaced jaws being urged toward each other. The jaws comprise integral portions of the handle which is constructed of metal and the metal is at least slightly bendable and resilient so as to enable the jaws to be biased toward each other. One of the jaws has a smooth bore formed therethrough and the other jaw has a threaded blind bore formed therein in registry with the smooth bore. A headed shank-type fastener is journaled through the smooth bore and threadedly engaged in the threaded blind bore whereby tightening of the fastener will cause the one jaw through which the fastener is journaled to be biased toward the other jaw. An elongated radially extending pickup finger is fixed to the head of the fastener and extends along the one jaw and outwardly beyond the free end thereof and may be used not only as a wedge to lift cloth to be cut between the rotary anvil means and the cutting disk means but also as a lever to angularly displace the head of the fastener from which it is supported.

3,815,231
ROTARY PINKING SHEAR DEVICE

Bessie R. Greenberg, 5016 Bingham St., Philadelphia, Pa. 19120

Filed Dec. 4, 1972, Ser. No. 311,648
Int. Cl. B26b *15/00, 13/10*
U.S. Cl. 30—228 10 Claims

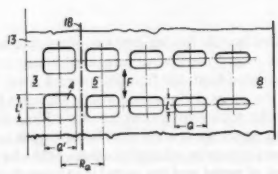


A rotary pinking shear device comprised of a body having a first end for receiving material to be sheared and a second end providing a handle, the first end has a bottom portion and a top portion spaced from the bottom portion to provide an opening in the body for receiving material therein, cutting means including a bottom wheel rotatably supported by the bottom portion of the body and extending into the opening of the body and a top wheel rotatably supported by the top portion of the body and extending into the opening of the body and engaging the bottom wheel for cutting material entering the opening of the body, and energizing means for rotating the bottom and top wheels.

3,815,232
SHEAR FOIL FOR A DRY SHAVER

Erich Liska, Hitzendorf, Austria, assignor to Payer-Lux Eduard Payer, Graz, Austria

Filed Feb. 9, 1973, Ser. No. 330,928
Claims priority, application Austria, Feb. 10, 1972, 1070/72
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 21 Claims

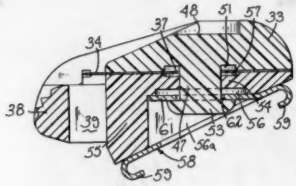


The invention relates to a shear foil for a dry shaver in which, for stiffening of the shear foil, the opening ratio of the shear holes arranged in one main area gradually decreases as compared to the opening ratio of the shear holes arranged in one of the border areas. In this, the measurement of the shear holes taken transversely to the moving direction of the cutting element carrier in the border area is kept equal or increased and only that measurement of the shear holes taken in the moving direction of the cutting element carrier is gradually decreased in the border area towards the edge of the shear foil as compared to the main area.

3,815,233
SHAVING CARTRIDGES

Harvey F. Carroll, Brooklyn, N.Y., assignor to Woodmont Industries, Inc., Milford, Conn.

Filed Sept. 5, 1972, Ser. No. 286,610
Int. Cl. B26b *21/54, 21/24*
U.S. Cl. 30—346.58 10 Claims

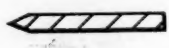


In a shaving cartridge for detachable mounting on a holding member which includes a handle, the combination of a rigid plastic base member securable to the holding member, a rigid plastic bridge member, and a razor blade permanently sandwiched between the base and bridge members. A plurality of projections on the bridge member are received through superposed apertures of the base member and blade, the heads of the projections being secured to the underside of the base member. The bridge member has a portion at each end which extends transversely of and over the cutting edge of the blade, thereby providing a pair of abutments for locating the blade. During assembly of the cartridge the cutting edge of the blade is aligned against the pair of abutments by application of a magnetic field, the assembly being consolidated while the blade is thus magnetically aligned.

3,815,234
CUTTER HEADS FOR LAWN TRIMMERS AND EDGERS AND WOODCARVING TOOLS

Theodore C. Nelson, Joan Dr. N., Salem, Oreg. 97303, and Arthur Truman Cummings, 872 Cummings Ln. N., Salem, Oreg. 97303

Filed Jan. 10, 1973, Ser. No. 322,307
Int. Cl. A01d *35/26*
U.S. Cl. 30—347 11 Claims



A pair of L-shaped blades is mounted on blind pivot pins in a high speed cutter head allowing the blades to swing out by centrifugal force and pivot back into the body of the head when an obstruction is encountered. Hubs on the blades are confined in recesses in the cutter head body to prevent release of a blade if a pivot pin should break. The sharpened outer end portion of each blade is angled forward in the direction of rotation to gather in material to be cut and apply a slicing action in shearing the material. The end portions of the blades may assume different shapes for various purposes as for lawn trimming and edging and for woodcarving.

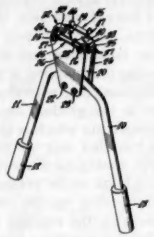
3,815,235
ARRANGEMENT FOR PRODUCING OPENINGS IN SHEET METAL BEAMS FOR ATTACHING FIXTURES OR THE LIKE

James Rush Marlar, 13317 Apex Rd., Banning, Calif. 92220

Filed July 10, 1972, Ser. No. 269,996
Int. Cl. B26f *1/36*
U.S. Cl. 30—363 7 Claims

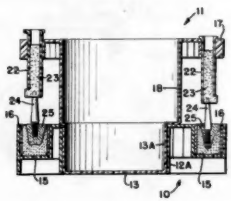
An arrangement for mounting fixtures or the like on two spaced sheet metal beams by which opposed openings are

formed in the sidewalls of the beams to receive rods attached to the fixtures, with the rods then being bent at their ends to prevent movement relative to the beams, the openings being



formed by a tool which includes opposed blades at the ends of rotational links, held by a support which includes a means for positioning it relative to the beam, while a scissors mechanism rotates the links to cause the blades to penetrate the sidewalls.

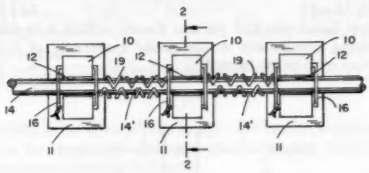
3,815,236
DENTAL RESTORATION JIG
Abraham J. Cooper, 1362 Gipson St., Far Rockaway, Queens, N.Y. 11691
Filed July 16, 1973, Ser. No. 379,748
Int. Cl. A61c *13/00*
U.S. Cl. 32—11 **6 Claims**



A dental restoration jig having a base to receive a plurality of cylindrical bands containing impressions of individual teeth, and a flanged dowel table for positioning and securing dowel holders, said table being slidably received in the base. The base and table permit the accurate setting of dowels into the dental impressions during casting of a tooth model so that subsequent alignment of teeth in a restoration is made easier and more accurate.

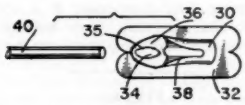
3,815,237
ORTHODONTIC BIASSING DEVICE
Melvin Wallshein, 8645 Bay Pky., Brooklyn, N.Y. 11214
Filed Nov. 29, 1972, Ser. No. 310,573
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **11 Claims**

An orthodontic biassing device is in the form of an elongated spring or sleeve having an elongated peripheral opening suitable for the passage of an arch wire therethrough. A spring is described which is formed by bending a continuous wire in the form of a repeating triangular pattern having two opposing sets of alternating peaks so that the peaks, when brought adjacent to one another and the wire, subsequent to bending of the same, substantially define a cylindrical surface with an elongated opening formed by the spaced adjacent peaks. According to another embodiment, a spring is formed by bending a helical coil along one of its axial edge portions so as to indent the turns of the helical coil along the axial edge portions substantially into closed C-shaped turns to thereby form a cylindrical cavity interiorly of the C-shaped turns which is suitable



for receiving an arch wire. The springs are easily mounted on arch wire sections extending between two adjacent brackets – the springs forming a biassing device on the arch wire for either pushing the brackets away from one another or drawing them towards one another. A sleeve, advantageously apertured or in the form of a bellows, is described which functions similarly to the spring.

3,815,238
ORTHODONTIC END TUBE
Melvin Wallshein, 8645 Bay Pky., Brooklyn, N.Y. 11214
Filed Mar. 5, 1973, Ser. No. 337,896
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 D **13 Claims**



An orthodontic end tube is described which is suitable for receiving an extension of an inner bow of a face bow orthodontic appliance. The end tube comprises a tubular member having an aperture passing therethro. gh which is dimensioned to receive an extension of the inner bow. The tubular member is provided with guide means along a peripheral portion of the tubular member. According to one embodiment, the guide means is embodiment the guide means is in the form of an elongated exposed groove having an open end at one end of the member. The groove extends at least partially along the length of the tubular member and is adapted to at least partially receive the extension of the inner bow. The tubular member, at the end of the tube where the groove has the open end, an end surface which is inclined relative to the axis of the tube. An inner surface portion of the aperture is exposed and positioned adjacent to and generally facing the direction of the groove. According to another embodiment, the guide means is in the form of a flared opening at one end of the aperture. Here, a V-shaped cutout is provided in the periphery of the tubular member and open at the flared end thereof, the cutout decreasing in width in a direction away from the flared end. In connection with the last embodiment, extensions having either a ball mounted thereon or a U-shaped loop are described which are adapted to engage the tubular member to both prevent excessive passage of the extension through the aperture as well as locking the extension against undesired mesial movement.

3,815,239
METHOD OF FILLING AND SEALING DEVELOPMENTAL PIT AND FISSURES

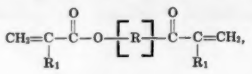
Henry L. Lee, Jr., 443 Orange Grove Cir., Pasadena, Calif. 91105; Jan Alexander Orlowski, 1304 Rubio St., Altadena, Calif. 91001, and Alvin I. Kobashigawa, 1451 W. 162 St., Gardena, Calif. 90247

Filed Jan. 13, 1972, Ser. No. 217,672

Int. Cl. A61k *5/00*

U.S. Cl. 32—15 **14 Claims**

Dental developmental pit and fissure sealant composition comprising component A composed essentially of a thermosetting resin of the formula:



wherein R_1 is hydrogen or alkyl of one to four carbon atoms; and R is $(CH_2CH_2—O)_x$ wherein x is an integer of 1 to 5, and an accelerator for said resin; and component B composed in one embodiment essentially of a solution of a peroxide catalyst for the resin of A, and in an alternative embodiment including additional resin of A.

The fissure sealant compositions disclosed have excellent surface tension characteristics, low viscosity, and good penetration ability.

The sealant compositions are applied stepwise by first applying a drop of either component to a cleaned and primed surface of a tooth to be sealed, allowing it to penetrate for 30 seconds, then applying a drop of the other component, allowing the components to remain in contact with each other for two minutes, and then removing any excess unpolymerized material.

In a preferred embodiment component A comprises diethyleneglycol dimethacrylate and N-bis(hydroxyethyl)-p-toluidine accelerator, and component B is comprised of diethyleneglycol dimethacrylate and benzoyl peroxide catalyst, the latter component being applied to the tooth first.

3,815,240
COUPLING FOR DENTAL HANDPIECES

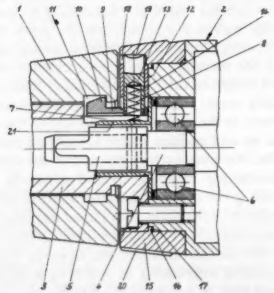
Hans Loge, Biberach/Riss, Germany, assignor to Kaltenbach & Voigt, Biberach/Riss, Germany

Filed Oct. 12, 1972, Ser. No. 296,907

Claims priority, application Germany, Oct. 13, 1971, 2151041; Sept. 1, 1972, 2243050

Int. Cl. A61c *1/08*

U.S. Cl. 32—26 **10 Claims**



A coupling for dental handpieces which is readily releasable and does not in any way hinder the dentist, so that there is no danger of unintentional uncoupling. For actuation of the pressure pin, to arrange externally on the sleeve of the drive element to be rotatable and axially non-displaceable a rotation ring the inner walls of which are formed with a recess for engagement of the end of the pressure pin, the depth thereof in the peripheral direction (related to the rotation ring) increasing gradually at least towards one side. If the pressure pin is disposed in the recess, in the snap-in position, then the coupling between the handpiece and the drive element is established. For releasing the coupling, it is then merely necessary to rotate the rotation ring, whereby the bottom of the recess produces, due to the gradual decrease in the depth, pressing-in of the pressure pin which is also gradual, until the coupling hook has travelled out of the annular groove. Coupling is effected in analogous manner. Unintentional actuation of the coupling hook or the pressure pin is impossible with the coupling according to the invention, since the coupling release device, i.e. the rotation ring, is arranged on the drive element and free rotatability between handpiece and drive element is guaranteed due to the engagement of the coupling hook into the annular groove.

3,815,241
DENTAL HANDPIECE WITH BUILT-IN COOLANT DUCT

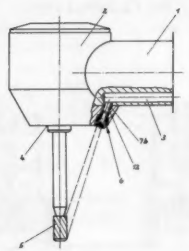
Bernhard Lingenhohle, Biberach/Riss, and Martin Saupe, Mittelbiberach, both of Germany, assignors to Kaltenbach & Voigt, Biberach/Riss, Germany

Filed Nov. 14, 1972, Ser. No. 306,555

Claims priority, application Germany, Nov. 17, 1971, 7143369[U]

Int. Cl. A61c *1/08*

U.S. Cl. 32—28 **6 Claims**



A dental handpiece comprising a portion having a built-in coolant conduit which communicates with a tubular insert which is mounted in the handpiece so as to spray coolant onto a tool fitted in the handpiece. The insert is removably mounted in the handpiece, as for example, by screw threads so as to be removable for cleaning or replacement purposes. The insert is provided with two ducts, one being oblique with respect to the axis of the insert. The insert carries a sealing member therewith and the two are inserted and removed as a unit from the handpiece.

3,815,242
APPARATUS FOR RECORDING THE CLOSURE BITE POSITION OF THE JAW OF A PATIENT AND THE JAW ARTICULATION MOVEMENT DURING BITING TOGETHER

Ernst Martfay, Sachseln, and Karl Rohrer-Spichtig, Flueli-Ranft, both of Switzerland, assignors to Jezsef Balogh, Luzern, Switzerland

Filed July 3, 1972, Ser. No. 268,707

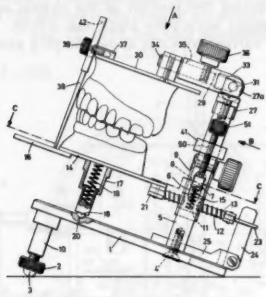
Claims priority, application Switzerland, July 6, 1971, 9922/71

Int. Cl. A61c *1/00*

U.S. Cl. 32—32 **10 Claims**

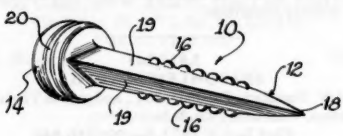
An apparatus for recording the closure bite position of a jaw of a patient and the movement of the jaw articulation on

hinges during biting together comprising an upper plate and a lower plate for receiving the cast impression or pattern of both jaws and two column members spaced from one another and anchored in a base plate. These column members support both of the plates which extend parallel to the base plate. According to the invention an inner member or part is arranged



between the upper plate and the lower plate, this inner member being adjustable and positionally arrestable according to the bite position angle. Furthermore, the inner member is detachably mounted upon an element inter-connecting the columns. The lower plate member is arranged to be movable and pivotable relative to the upper plate member.

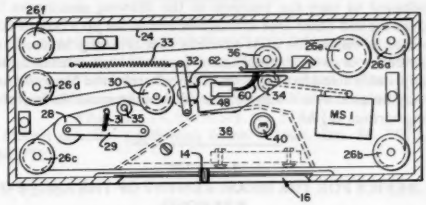
3,815,243
WEDGE FOR DENTAL MATRIX BANDS
Wilmer B. Eames, 3898 Sable Dr., Stone Mountain, Ga. 30083
Filed June 18, 1973, Ser. No. 370,778
Int. Cl. A61g *5/12*
U.S. Cl. 32—63 **1 Claim**



A wedge structure adapted to be used in association with dental matrix bands of the type utilized when inserting filling material in tooth cavities. The wedge structure is adapted to be inserted between a tooth carrying a band and an adjacent tooth whereby the wedge will serve to tightly hold the band against the tooth. The wedge preferably defines a triangular cross section and a serrated fin appendage on the stem whereby the wedge is particularly suited for insertion at the base of adjacent teeth in the area where undesirable movement of filling material is most prevalent.

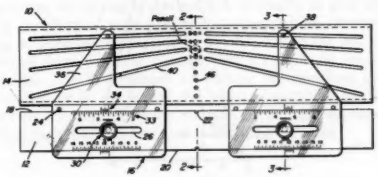
3,815,244
DENTAL INSTRUCTION DEVICE
John W. Hein, 3 Bridge St., Medfield, Mass. 02215
Filed Apr. 29, 1971, Ser. No. 138,626
Int. Cl. A61c *19/00*
U.S. Cl. 32—71 **10 Claims**

A dental device to provide instructions for cleaning of the teeth and gums wherein a series of instructions are set forth on an endless strip or band. The strip, with the instructions exposed to the viewer, is driven at constant speed. The window comprises a tinted and a clear portion. The instruction being followed passes first under the clear portion and then under the tinted portion and then out of view. This window arrangement allows the viewer to be carrying out one instruction while anticipating the next instruction. At the initiation of



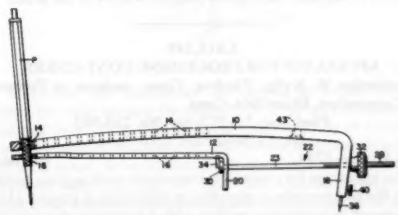
each step in the cycle an alarm, light and buzzer, is actuated to advise the viewer the next instruction in the time sequence of instructions should be followed.

3,815,245
DRAFTING DEVICE
George W. Streander, Alamogordo, N. Mex., assignor to Design Systems, Inc., Alamogordo, N. Mex.
Filed Nov. 5, 1971, Ser. No. 196,051
Int. Cl. B43k *9/00*
U.S. Cl. 33—27 F **9 Claims**



Curves of different radii may be generated by displacement of a point in a tracing plate element relative to an imaginary fixed center of curvature remote from the plate element. A selected pair of slots disposed at an angle to each other on the tracing element receives a pair of guide pins fixedly spaced from each other by sliders adjustably positioned on a base element. Tracing apertures are formed in the tracing element between the slots to receive a pencil or other drawing implement in contact with a planar surface while tracing an arc.

3,815,246
DRAFTING TOOL
William W. Prickett, 37-21 87th St., Jackson Heights Queens, New York, N.Y. 11372
Filed Aug. 20, 1973, Ser. No. 389,973
Int. Cl. B41l *9/04*
U.S. Cl. 33—27 C **4 Claims**



A single, versatile drafting tool for drawing an infinite variety of arcs, circles, curves and angles, comprising upper

and lower resilient arms, each having a plurality of aligned openings for receiving such as a mechanical pencil or other drawing instrument therein for drawing a variety of arcs and circles, adjustable tension means linking the arms and being adapted to vary the position of the drawing instrument for drawing still other arcs and circles and to set up a bowed condition in one of the arms whereby that arm may be used as a guide for drawing curves, and a T-square head releasably and adjustably fixed to one of the arms whereby the head and arm may be used as a T-square, the head being movable for forming various angles.

3,815,247

DEVICE FOR THE MEASUREMENT OF THE ANGLE OF KYPHOSIS

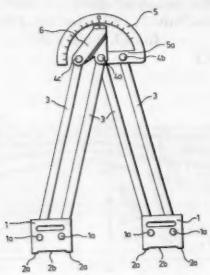
Hans Ulrich Debrunner, 8 Niesenweg, 3038 Kirchlindach, Switzerland

Filed Feb. 14, 1973, Ser. No. 332,487

Claims priority, application Switzerland, Feb. 18, 1972, 2357/72

Int. Cl. G01b *5/24*

U.S. Cl. 33—75 R **5 Claims**



A device for the measurement of the angle of kyphosis of the human spinal column is disclosed. The device is provided with an angularly calibrated scale and a co-operating pointer pivotably connected to the scale. The scale carrying member is so coupled to a first probe member by a first parallelogram linkage that a portion of the scale carrying member extending between the points of pivotal interconnection with the first linkage is always parallel to a contact surface provided on the first probe member. The pointer is so coupled to a second probe member by a second parallelogram linkage that a portion of a member carrying the pointer extending between the points of pivotal interconnection with the second linkage is always parallel to a contact suface provided on the second probe member. In use, the respective contact surfaces of the first and second probe members are pressed against separated spinous processes of a human spine to measure the difference in slope between the two parts of the spinal column contacted by the respective probe members. This angular deviation is indicated by displacement of the pointer relative to the scale.

3,815,248

APPARATUS FOR PROCESSING CONTAINERS

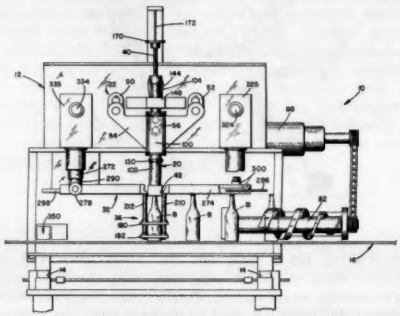
Constantine W. Kulig, Windsor, Conn., assignor to Emhardt Corporation, Bloomfield, Conn.

Filed Mar. 1, 1972, Ser. No. 230,583

Int. Cl. B07c *5/06, 1/10, 5/08*

U.S. Cl. 33—174 L **29 Claims**

An apparatus for processing containers such as glass bottles and the like includes a plurality of dimensional gauges which are swept in a tracking motion with a container moving at a constant speed on a conveyor while the several gauging operations are performed. The gauges are mounted on four-bar linkages which have orbital links swept in adjacent relationship with the conveyor so that the gauges move at substantially the same speed as the articles along a tracking segment of the conveyor where the gauging operations are performed. A plug or choke gauge carried on one of the orbital members is reciprocated in and out of a moving container by a separate drive mechanism at a speed modulated to provide low impact velocities and rapid reciprocation of the gauge in and out of the container during the portion of the orbital movement wherein the gauges accurately track the article. A finish-height gauge is carried coaxially about the plug gauge and is



reciprocated at a modulated speed different from that of the plug gauge so that the impact velocities on the container can be separately optimized for each of the gauges. The apparatus also includes a set of gauging rings which are orbited at a modulated speed along the tracking segment of the conveyor to check the body dimensions of the containers. The combination of the three gauges in a single inspection machine permits the important dimensions of a container, such as a glass bottle, to be inspected simultaneously along a single segment of a conveyor on which the containers are transported prior to filling or other operations.

3,815,249

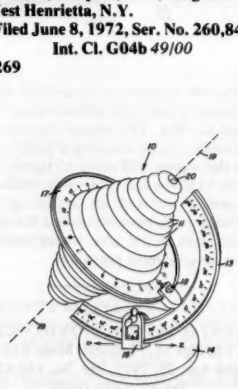
SHADOWLESS SUN DIAL

Robert W. Gundlach, Fairport, N.Y., assignor to Vencraft Corporation, West Henrietta, N.Y.

Filed June 8, 1972, Ser. No. 260,840

Int. Cl. G04b *49/00*

U.S. Cl. 33—269 **28 Claims**



A sundial is formed with a reflecting surface curving in an arc around an axis so that the image of the sun reflected from the surface can be viewed from points along the axis. The surface is mounted with its axis parallel to the axis of the rotation of the earth, and a time scale, also visible from the axis, indicates the time position of the reflected image of the sun.

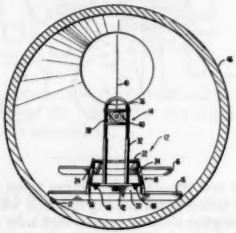
3,815,250
TARGET SYSTEM FOR LAYING SEWER PIPES

Roger J. Roodvoets, and James Stapert, Jr., both of Grand Rapids, Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.

Division of Ser. No. 804,487, March 5, 1969, Pat. No. 3,634,941. This application Sept. 30, 1971, Ser. No. 185,251 The portion of the term of this patent subsequent to Jan. 17, 1989, has been disclaimed.

Int. Cl. G01c *15/00*

U.S. Cl. 33—286 6 Claims



This disclosure relates to an adjustable target for use in aligning pipes with a laser beam or other similar collimated light beam which is projected axially with the pipe. The target has a base member, a level carried by the base member, an upright target carried by and vertically adjusted relative to the base. Extension means for the base member are also disclosed for extending the base laterally to permit the target to be employed in larger pipes.

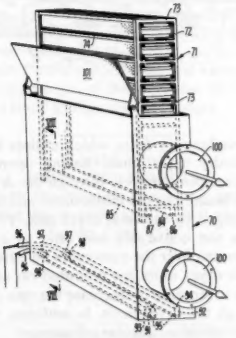
3,815,251
METHOD FOR VACUUM DEHYDRATION

Arthur Van Gelder, 409 W. Aliso St., Ojai, Calif. 93023

Filed Mar. 10, 1972, Ser. No. 235,450

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 6 Claims



A method and apparatus for the dehydration of products where the products are placed in a cell comprising electrically conductive transverse heating plates uniformly spaced by conductive spacers, the plates being connected in parallel and uniformly conductive over their entire surfaces; said plates being the only heating source. The filled cells are placed in individual carriers. One or more such carriers are treated in separately controlled chambers under high vacuum of the order of 100 to 1000 microns of mercury with rapid withdrawal of water vapor and in which a single source of electrical power under external control is connected to each cell for the simultaneous and uniform heating of each plate of each cell.

3,815,252
MANUFACTURE OF DYESTUFF POWDERS

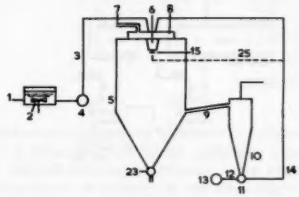
William Frederick Skuce; David Hugh Spence, and Stuart Anthony Whitefoot, all of Manchester, England, assignors to Imperial Chemical Industries, Limited, London, England

Filed Jan. 19, 1973, Ser. No. 324,971

Claims priority, application Great Britain, Jan. 26, 1972, 3682/72

Int. Cl. F26b *5/08*

U.S. Cl. 34—8 2 Claims



A process for drying water-soluble dyestuffs to give free-flowing powders of very low dust content which comprises feeding an aqueous suspension of the dyestuff to the disc of a centrifugal drier, said disc rotating with a peripheral speed of only 6,000–12,000 ft/minute contacting the resultant spray with heated air to evaporate the water, separating any fine dust which is formed from the coarser, particulate matter and returning the separated fine dust to the spraying zone.

3,815,253
COOLING MATERIAL FROM A KILN

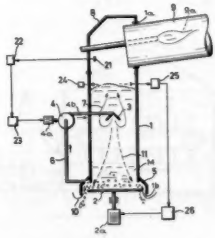
Herbert Deussner, Bensberg-Refrath, Germany, assignor to Klockner-Humboldt Deutz Aktiengesellschaft

Filed May 3, 1973, Ser. No. 356,952

Claims priority, application Germany, May 4, 1972, 2221739

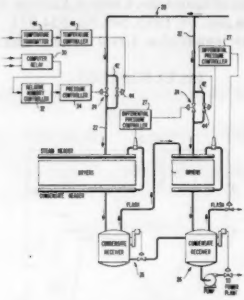
Int. Cl. F26b *7/00*; F27b *7/38*

U.S. Cl. 34—20 17 Claims



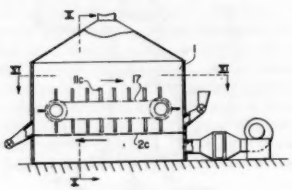
A method and mechanism for cooling granulate material which includes heating the material in a kiln and directing the material from a kiln into an upper inlet opening of a vertical cooling chamber with the material passing downwardly to flow out of a lower material discharge opening from the cooling chamber, and drawing air from the outside through the material at the discharge opening and forcing said air by an air pump into the material within the cooling chamber with the air flowing upwardly and passing into the kiln. A portion of the air directed into the material also flows downwardly to be recirculated.

3,815,254
METHOD AND APPARATUS FOR CONTROLLING THE AMOUNT OF MOISTURE REMOVED FROM MATERIAL
Winslow B. Mills, 2800 Drake Rd., Pensacola, Fla. 32503
Filed Jan. 18, 1972, Ser. No. 218,714
Int. Cl. D21f 5/06, 5/18; F26b 3/00
U.S. Cl. 34—31 8 Claims



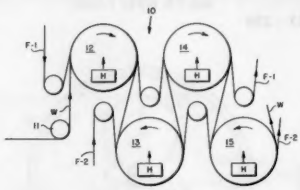
In the manufacture of paper wherein the final step is to convey the paper over a series of steam heated drying drums; sensing the temperature and humidity of the air conveyed from the area of the paper through a duct situated over the last number of drums, and controlling the amount of steam admitted to the drums to control the temperature of the drums and ultimately the amount of moisture removed from the paper upon initial start up or heating of the drying means or upon breakage of the sheet of paper during a drying operation.

3,815,255
FLUIDIZED BED DRYER
Yukio Yamato, Tokyo, Japan, assignor to Yamato Sanko Mfg., Ltd., Tokyo, Japan
Filed Sept. 20, 1972, Ser. No. 290,764
Claims priority, application Japan, Oct. 8, 1971, 46-78633
Int. Cl. F26b 17/10
U.S. Cl. 34—57 D 7 Claims



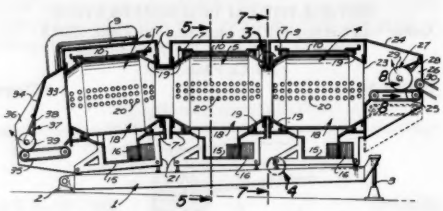
A fluidized bed dryer containing means for effecting fluidization and transportation of a material being treated from the inlet or supply side of a treatment housing to the exit or discharge side, including the utilization of a gas distributor in cooperation with a heating gas which is applied to the materials through said distributor. The dryer can be used to process a variety of difficult-to-treat materials such as a slurry of materials, and materials containing solidified portions as well as those having a high degree of cohesion, adhesion and/or containing lumps.

3,815,256
GROOVED DRYER
Donald A. Ely, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.
Filed Mar. 12, 1973, Ser. No. 339,741
Int. Cl. F26b 11/02
U.S. Cl. 34—111 3 Claims



The method and apparatus for drying moist traveling paper webs in a high speed papermaking machine wherein the dryer drums have peripheral surfaces provided with narrow venting grooves in particular configuration to facilitate air and steam ventilation carried over the dryer drum surface by the oncoming paper web.

3,815,257
CONTINUOUS LAUNDRY DRYER
Benjamin H. Freze, Garden Grove, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.
Filed Apr. 4, 1973, Ser. No. 347,792
Int. Cl. F26b 11/02
U.S. Cl. 34—129 8 Claims

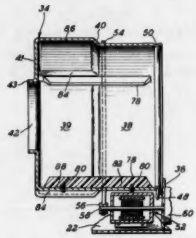


A continuous laundry dryer which utilizes a series of self-contained laundry dryer units, having open ends so that laundry may pass progressively through the dryer units. Conveyors deliver laundry to the initial dryer unit and remove the laundry discharged by the final dryer unit. Yieldable closure rollers overlie the conveyors and tend to conform to the laundry as it passes over the conveyors on entering or leaving the dryer. The dryer units are mounted on an angularly adjustable frame to increase or decrease the rate of movement of laundry through the dryer units. In addition, the dryer units are capable of individual angular adjustment.

3,815,258
DRYER HAVING DRUM WITH TWO DIFFERENT DIAMETERS
William L. Beard, Jr., Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Nov. 30, 1972, Ser. No. 310,984
Int. Cl. F26b 11/04
U.S. Cl. 34—133 7 Claims

A rotary tumbling drum for a clothes drying appliance providing a maximum drying volume for a given cabinet size.

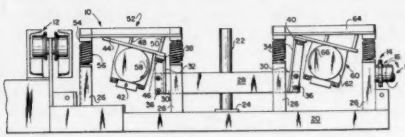
The drum is of a stepped configuration, having a large diameter portion positioned at the front of the drying appliance adjacent a loading opening in the cabinet and having a reduced diameter portion at the rear of the appliance adjacent to a drive motor within the cabinet.



3,815,259
SHEET EDGE ALIGNING APPARATUS

Lamar T. Atwood, Cumberland Center; Joseph E. Radomski, Saco, and David E. Wilson, Cumberland Center, all of Maine, assignors to Southworth Machine Company, Portland, Maine

Filed June 8, 1973, Ser. No. 368,373
Int. Cl. F26b *13/00*
U.S. Cl. 34—150 **7 Claims**

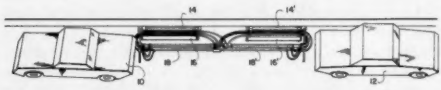


An improved mechanism for aligning sheet edges in a sheet winding, turning and aligning apparatus of the type wherein boards or sheets comprising a load in the apparatus are, subsequent to initial operations such as ink pack breaking and the like, tilted by the apparatus to dispose the bottom and side edges at an angle from the horizontal and vertical planes and the bottom and side edges of the sheets are then vibrated and aerated when so tilted to align the sheet edges.

3,815,260
SIMULATED VEHICLE

Joe Heaton, 120 W. Washington, Tipton, Ind. 46072

Filed May 8, 1973, Ser. No. 358,233
Int. Cl. G09b *9/04*
U.S. Cl. 35—11 **10 Claims**

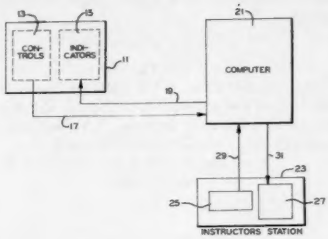


Automobile driver training, particularly a simulated vehicle which is impact resilient and, therefore, may be used as a teaching and scoring aid in parking instruction. The lightweight vehicle includes fore and aft resiliently suspended bumper elements, including electrical signalling means for scoring and signalling the driver-trainee upon collision impact.

3,815,261
PHASE-ORIENTED DISPLAY

Victor Faconti, Jr., Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,670
Int. Cl. B64g *7/00;* **G09b** *9/08*
U.S. Cl. 35—12 F **6 Claims**

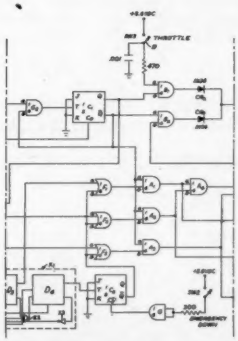


A method providing to an instructor in a flight simulator, or the like, a phase oriented display containing only the most important aircraft information relating to the phase of the mission being flown, as opposed to the usual display of all information at all times. The total training mission is divided into phases and logic employed to detect the mission phase in progress and automatically select for display the information deemed most important to that phase.

3,815,262
IN-FLIGHT RETRACTIBLE LANDING GEAR TRAINING SIMULATOR FOR FIXED LANDING GEAR AIRCRAFT

Ronald A. Patterson, 1010 Ross Ln., North, Medford, Oreg. 97501, and Walter N. Majure, Jacksonville, Oreg., assignors to said Ronald A. Patterson, by said Majure

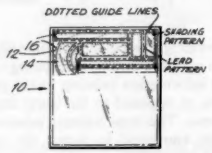
Filed May 29, 1973, Ser. No. 364,719
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 B **9 Claims**



When a pilot, fully qualified and licensed, and possibly of long accident-free experience, in the flying of fixed landing gear aircraft, desires to progress to retractible landing gear aircraft, the insurance companies require extensive flight practice with an instructor as a condition precedent to the issuance of a required insurance policy. The present invention provides a simple, compact, inexpensive simulator for installation on fixed landing gear aircraft, having (1) a manually operable actuator corresponding to the landing gear lowering actuator provided conventionally on rectractible landing gear aircraft, (2) indicator means responsive thereto for randomly simulating either correct lowering and locking of the individual land-

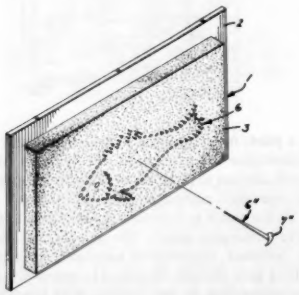
ing wheels or a malfunction of one or more of the landing wheels, and (3) means corresponding to a conventional emergency landing gear lowering actuator for cancelling any indication or indications of malfunction. The simulator further includes a sounding device and a warning light for reminding the pilot that he has overlooked "lowering the landing gear" whenever he has cut the throttle without having gone through the landing gear lowering procedure, and for calling attention to the fact that not all landing gear lights are lighted when they should be.

3,815,263
KIT FOR MAKING WORK OF ART HAVING THE APPEARANCE OF A STAINED-GLASS WINDOW
Jerome Oberwager, Great Neck, N.Y., assignor to National Teaching Aids, Inc., Garden City Park, N.Y.
Filed Dec. 22, 1972, Ser. No. 317,749
Int. Cl. B44f 1/06
U.S. Cl. 35—26 **7 Claims**



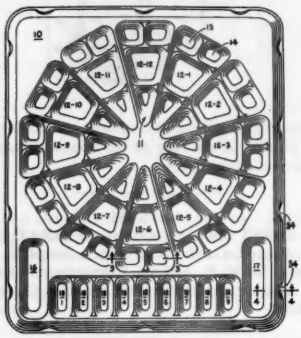
There is disclosed a kit for constructing a simulated stained-glass window. A front transparent plastic sheet has lead lines and a shading pattern printed on it. Guide lines which define bounded areas are also printed on the sheet, but they are obscured by the superimposed lead lines when looking at the front of the sheet. There are also provided a plurality of sheets of translucent colored plastic which have light-transmitting characteristics which simulate those of stained glass. Each of these sheets has a paper backing on which there are printed areas which correspond to respective areas on the front sheet defined by the guide lines. The pre-defined sections of the colored sheets are cut and then placed on the front sheet in the proper positions. The backing paper is then removed from the cut sections. Highly plasticized materials are used so that they are self-adhering without the need for adhesives.

3,815,264
HOBBY KIT FOR SCULPTURING
William S. Mack, 4701 Poplar Br. Rd., Minneapolis, Minn. 55431
Filed July 31, 1972, Ser. No. 276,375
Int. Cl. G09b 11/00
U.S. Cl. 35—26 **3 Claims**



Sculptures are made by inserting nails into a design base of foam plastic until further penetration of the nails is stopped a pre-determined distance from the point of penetration by either a relatively dense backing material or a sleeve on a nail.

3,815,265
COLOR BLENDING SET AND PAINT MIXING TRAY
Robert C. DePauw, 18 Edgewood Hills, East Peoria, Ill. 61611
Filed Mar. 26, 1973, Ser. No. 344,547
Int. Cl. G09b 11/10
U.S. Cl. 35—28.5 **4 Claims**

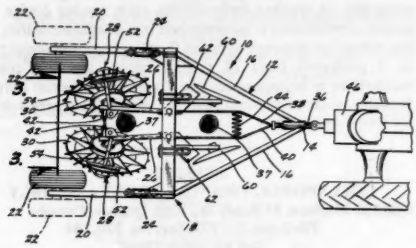


A color mixing tray which is a planar member with a plurality of wells arranged in an annular pattern. There are a plurality of wells in each of a plurality of sectors of the annular pattern, with wells in each sector radially spaced and each well in each sector having a counterpart in the other sectors. The counterpart wells of the sectors are in an annular ring within the annular pattern. Each well is separated from each other well by a wall and the walls between the wells within each sector are lower in height than the walls between the wells in adjacent sectors to facilitate transfer of paint between wells within a sector while maintaining isolation from sector to sector. A color mixing set combines the mixing tray with a supply of paints of mixing hues in balanced primary colors and in black and white, each paint supply being in a container having provision for dispensing measured quantities of paint therefrom. The set further includes a student guide having a spectrum chart representing the wells of the mixing tray together with indicia indicating the location of and providing instructions for mixing of the red, yellow and blue colors to create secondary and intermediate colors and for the mixing of the colors with each other and with the black and white paints to create shades, tints and tones.

3,815,266
STUMP PULLING IMPLEMENT
James E. Schmitz, Box 94, Ventura, Iowa 50482, and Duard J. Suby, Rt. 1, Clear Lake, Iowa 50428
Filed Dec. 1, 1972, Ser. No. 311,113
Int. Cl. A01g 23/06
U.S. Cl. 37—2 R **17 Claims**

An implement frame includes a pair of horizontally spaced apart rearwardly extending horizontally pivotal arms which include stump-engaging wheels on their free ends. The stump-engaging wheels are tilted inwardly at their bottom and rear edges. The peripheral edges of the wheels include teeth elements for engagement with the ground and stumps. A hitch means includes a pair of rearwardly extending cables connected to the arms and to a rod member extending through a tongue sleeve. The clamping action on the stumps by the wheels is directly related to the pulling action required to move the implement forward and to lift the stump out of the ground. The implement frame includes rearwardly extending support arms on opposite sides of the stump wheel arms and

ground support wheels are provided on the support arms. A power cylinder is connected to each of the support arms for adjustably pivoting the arms to vary the height of the stump wheels above the ground. The roots of the stumps are cut by a



pair of spaced apart discs and chisel plows. A spring may be placed between the cables to provide for a smooth pulling action. An alternate hitch includes the rod member extending to adjacent the stump wheels and having outwardly extending pivotal elements connected to the arms.

3,815,267

METHOD AND APPARATUS FOR SUCKING UP MATERIAL FROM THE BOTTOM OF A BODY OF WATER

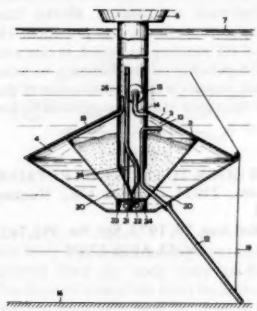
Johannes Bertus Laarman, Zwijndrecht, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Sept. 15, 1972, Ser. No. 289,292

Claims priority, application Netherlands, Sept. 23, 1971, 7113102

Int. Cl. E02f 3/88

U.S. Cl. 37—58 **8 Claims**



Material is sucked up from the bottom of a body of water through a suction pipe into a wholly submerged container. The container is filled with water to submerge and trim the container, and this water is pumped out to create the suction that raises the material and to balance the added weight of the material so that the container remains at a constant depth. Material is discharged in a stream of water upwardly from the bottom of the container, and water is simultaneously admitted to the ballast tanks to maintain the container submerged. The container is in the form of two conical frusta that open into each other and are traversed by a vertical shaft for the various conduits. The container for the material is centrally disposed and the ballast tanks are peripherally disposed.

3,815,268

BALLAST REGULATOR CONTROL MEANS

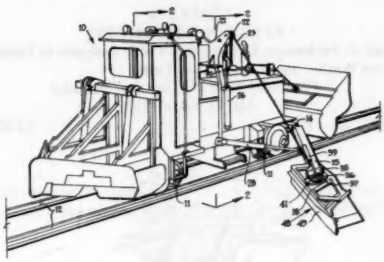
William James Yard, Cavan Rd., Dry Creek, Hazelwood Park, Australia

Filed Aug. 7, 1972, Ser. No. 278,430

Claims priority, application Australia, Aug. 4, 1971, 5773/71

Int. Cl. E02f 5/22

U.S. Cl. 37—105 **6 Claims**



Control means for controlling the ballast box of a ballast regulator used for positioning or "regulating" ballast on the shoulder of a railroad track, wherein the box is mounted for universal movement on the outer end of an arm, the inner end of the arm being coupled to the chassis of the ballast regulator by means of a universal coupling, there being provided hydraulic cylinders for adjusting the position of the box relative to the arm about two respective pivotal axes and there also being provided a cable attached to the outer end of the arm coupled to hoisting means on the vehicle chassis for controlling the height of the arm.

3,815,269

SLIDE CALCULATOR FOR DETERMINING SELECTED PERIODS OF TIME

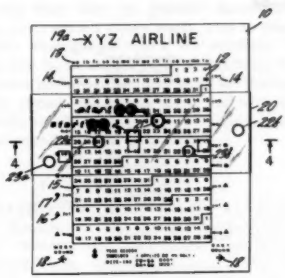
Susan J. Roselli, Via Oglio, 00198, Rome, Italy

Filed Nov. 30, 1972, Ser. No. 310,715

Claims priority, application Italy, Dec. 1, 1971, 54443/71; Jan. 24, 1972, 47913/72

Int. Cl. G09d 1/00

U.S. Cl. 40—110 **9 Claims**



A slide calculator particularly for determining the expiration dates of selected periods of time comprises a flat rectangular body having a calendar of particular configuration on at least one face and a traveler in the form of a flexible belt of transparent material which encircles the body. The belt carries one or more indices representing the start of a selected period and also one or more indices indicating the end of the

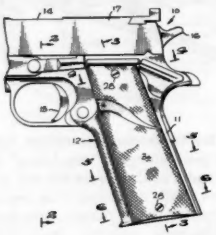
period selected. The belt is slidable linearly on the body and, by reason of its flexibility, is also movable in a rotational direction. When the belt is moved so as to bring the index representing the start of a selected period into registry with a selected date of the calendar on the body, the index on the belt representing the end of the selected period coincides with the corresponding date on the calendar. In order to determine periods of different lengths the traveler is provided with indices of different shapes or colors for the respective periods.

3,815,270

RESILIENT PISTOL GRIP

Frank A. Pachmayr, Los Angeles, Calif., assignor to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed May 29, 1973, Ser. No. 364,863
Int. Cl. F41c *23/00*
U.S. Cl. 42—71 P **12 Claims**



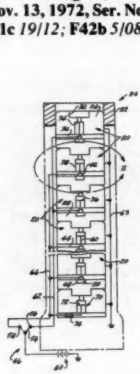
A resilient pistol grip to be connected to the handle of a pistol and including a body of elastomeric material forming two side portions of the grip to be connected to opposite sides of the pistol handle, with each of these side portions containing rigid reinforcing plates, and with the elastomeric body having a forward portion extending between and interconnecting the two side portions and adapted to extend across the front of the pistol handle.

3,815,271

FIRE CONTROL MECHANISM FOR FIREARMS

Robert W. Lynn, 1774 N. Craig St., Altadena, Calif. 91001

Filed Nov. 13, 1972, Ser. No. 305,980
Int. Cl. F41c *19/12*; **F42b** *5/08*; **F42c** *11/00*
U.S. Cl. 42—84 **24 Claims**



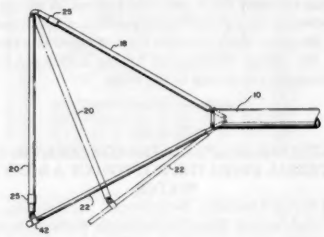
A fire control mechanism for firearms having projectiles loaded in superimposed relation includes a separate arming device associated with each projectile. Each arming device is responsive to changes in gas pressure, heat buildup, or the like, generated when the projectile immediately ahead of it is fired to thereby automatically arm the primer of the next projectile in the firing order. The armed primer is then in a condition capable of being activated by the firearm triggering mechanism to fire its corresponding projectile. In one embodiment, each arming device and primer are integral with the projectile. In another embodiment, each arming device and primer combination is incorporated into a separate wafer, and the wafers are disposed between the superimposed projectiles. In a preferred form of the invention, the fire control mechanism is incorporated into a variety of special purpose firearms, such as survival rifles or missile launchers suitable for throw-away use.

3,815,272

COLLAPSIBLE, TRIANGULAR NET ASSEMBLY

Gilles E. Marleau, 85 Brady St., Hull, Quebec, Canada

Filed Jan. 3, 1973, Ser. No. 320,744
Int. Cl. A01k *77/00*
U.S. Cl. 43—12 **4 Claims**



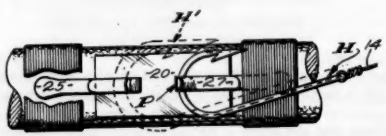
A collapsible three sided fishing net, having a handle which combines to form a storage cylinder for the net when it is in collapsed condition. Three solid net-supporting arms cooperate to expand from collapsed parallel position to form a triangle, firmly engaged with a handle. The handle itself serves as a storage holder in one embodiment of the invention, and in a second embodiment a secondary, shorter handle integral with the net supporting arms is also provided. The triangular configuration of the net may be varied, in one embodiment of the invention, depending on the function to which the net is put. In collapsed condition one embodiment of the net is compact enough to be stored in an average-sized tackle box.

3,815,273

FISH HOOK TO FISH POLE RETAINER

John L. Perkins, 22021 Catalina Cir., Huntington Beach, Calif. 92646

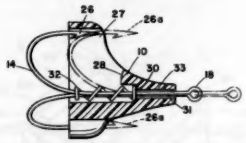
Filed Aug. 29, 1973, Ser. No. 392,742
Int. Cl. A01k *87/00*
U.S. Cl. 43—25.2 **10 Claims**



A fish hook holder engaged on a fishing rod remote from the tip end thereof to releasably hold a flat recurvate fish hook on the end of a line extending freely from said tip end. The holder comprises a magnet with a flat pole surface disposed radially outward from the rod and adapted to orient and hold the hook in substantially flat engagement on the pole surface. A plurality of spaced hook engaging posts are disposed ad-

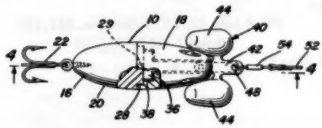
jacent to and projecting outward from the pole surface to engage the hook and stop axial forward shifting of the hook relative to the pole surface and rod.

3,815,274
FISH HOOK APPARATUS WITH COVERING BODY PORTION
George H. Schleif, 4030 Chamoune, San Diego, Calif. 92105
Filed July 17, 1972, Ser. No. 272,488
Int. Cl. A01k *85/00*
U.S. Cl. 48—42.1 **2 Claims**



An integral and substantially rigid fish hook that may have multiple hook portions, with an enclosing body that covers the hook portions, which body is movable to allow the hook portion to project through the body, upon said body being moved by a fish biting the body or contacting it forcefully.

3,815,275
LURE WITH MULTI-PURPOSE DIVING VANE
Gerald J. Amundson, 312 E. Union St., Punxsutawney, Pa. 15767
Filed May 2, 1973, Ser. No. 356,284
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.22 **10 Claims**



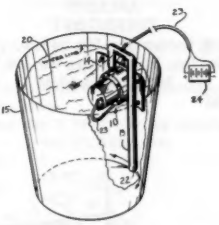
A fish lure body is provided having front and rear ends and a hook supported from the body rearward of the front end thereof. The forward end of the body includes diving fin structure releasably supportable from the body in each of four different positions, the diving fin structure being of a configuration to act upon the water through which the lure is pulled in a different manner in each of the four different positions of the diving fin structure.

3,815,276
CRAB LURE AND TRAP
Daniel A. Harrison, 29 Central Ave., Highlands, N.J. 07732
Filed June 26, 1973, Ser. No. 373,677
Int. Cl. A01k *95/00;* **A01m** *23/00*
U.S. Cl. 43—43.1 **2 Claims**

A crab lure and trap which is formed of two fishing weights joined together about a section of cloth material to which a number of long loops of fishing line are attached. The two halves of the fishing weight are attached to one another by means of a bolt, with a hook for holding bait attached to the

lower section for the purpose of attracting a crab which then becomes entrapped in the attached long loops of fishing line.

3,815,277
AERATED BAIT CONTAINER
William B. Murray, Houston, Tex., assignor to Sportcraft, Inc., Houston, Tex.
Filed Jan. 26, 1973, Ser. No. 327,088
Int. Cl. A01k *97/04*
U.S. Cl. 43—57 **9 Claims**

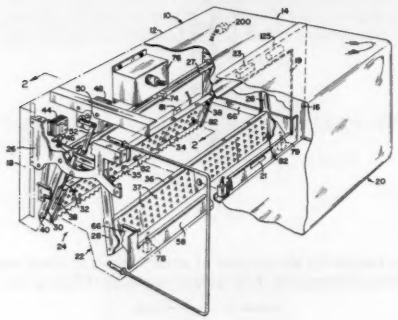


A container or bait bucket or pail has a pump mounted therein with a suction inlet at a substantial elevation, but below water level, and with a discharge line extending first upwardly and then over to provide downwardly directed discharge ports spaced above water level to discharge water downwardly through air space for aeration. Thence, the discharge line turns downwardly to discharge further water through ports just above the bottom of the bucket, thereby to direct flow stream water to circulate and keep stirred up the bait, as shrimps, which might otherwise stack up at the bottom of the bucket and smother each other.

3,815,278
AUTOMATIC ELECTRO-MECHANICAL RODENT TRAP
Arthur L. Beaton, 3810-16th Ave., North, St. Petersburg, Fla. 33064; Dietrich H. Schnell, 11447-78th Ave., North, Ridgewood Apts. No. 202, Seminole, Fla. 33060, and Victor A. Beaton, 3852-16th Ave., North, St. Petersburg, Fla.
Filed Aug. 5, 1971, Ser. No. 169,332
Int. Cl. A01m *19/00*
U.S. Cl. 43—99 **11 Claims**

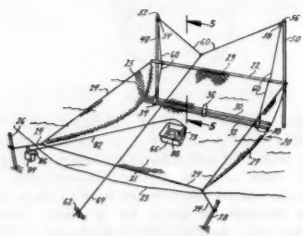
A device for effectively trapping, killing and disposing of rodents and ectoparasites. A rectangular housing including a trapping chamber extending the length of the housing to form a runway into which the rodents pass. Arranged on opposite sides of and parallel to the runway is a pair of electrically

chargable plates held in a normally open position. These electro-mechanically controlled plates are responsive to a photosensitive device triggered by passage of a rodent into the runway which causes the plates to close by spring tension on the rodent. The plates are attached to a pair of rotable support



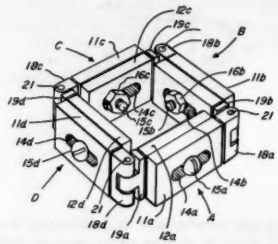
arms whereby the rodent is mechanically placed in a disposal chamber attached to the housing where the dead rodent is debugged and retained until removal from the area. The electro-mechanical circuitry automatically resets the plates so the device may be recycled independent of any operator action.

3,815,279
FISHING NET
Eugene M. Poirot, Golden City, Mo. 64748
Filed Dec. 10, 1971, Ser. No. 206,789
Int. Cl. A01k *69/10*
U.S. Cl. 43—105 **8 Claims**



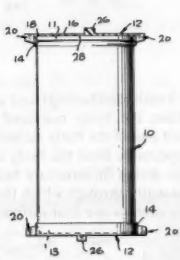
A fishing net has a portion thereof disposable below the surface of a body of water and has an elongated opening in that portion. Elongated gauging elements are disposed at, and serve to define opposite sides of, that elongated opening; and adjustable spacers hold the confronting surfaces of those gauging elements at desired distances from each other to control the size of the fish which can escape from that fishing net when that fishing net is raised. The sides of the fishing net are generally vertically directed whenever that fishing net is in raised position; and those sides rapidly move into generally vertically directed position as that fishing net is raised, and thereby keep fish from escaping. An elongated stiff member is secured to the fishing net above the level of, and in registry with, the elongated gauging elements; and flexible tension members extend between that elongated stiff member and one of those elongated gauging elements to relieve the fishing net of the weights of those elongated gauging elements. An electric switch is disposed within the fishing net; and it will be biased toward one position but will be held out of that position by food placed within that fishing net. As that food is eaten by the fish, that electric switch will move into the said one position, and will thereby provide a desired electrical effect.

3,815,280
DEVICE IN LOOP FORM HAVING SIDES WITH RELATIVELY SWIVELABLE PIVOTABLE AND SLIDABLE MEMBERS
Michael Gilfillan, 619 Robinwood Ln., Hopkins, Minn. 55343
Filed May 14, 1973, Ser. No. 360,401
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 R **7 Claims**



A device for use by nervous or hyperactive persons for reducing nervousness as a result of manipulation thereof, said device including a plurality of sides joined together to form a closed loop, each of the sides comprising at least two members longitudinally and pivotally moveable relative to each other and each of the members having a hinge part swiveled thereto and pivotally joined to a swiveled hinge part of a member of an adjacent side.

3,815,281
TOY STRUCTURE UTILIZING A CONTAINER
Abdenoor Kander, 22434 Bessemer St., Woodland Hills, Calif. 91364
Filed July 20, 1973, Ser. No. 381,147
Int. Cl. A63h *33/100*
U.S. Cl. 46—11 **12 Claims**

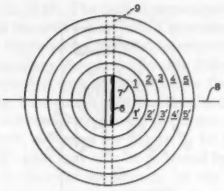


Flexible resilient, e.g., plastic, caps are provided for containers, e.g., beverage cans, such caps being mounted at each end of the container, each such cap having a plurality of fork-shaped connector grips around the periphery of the cap, and a center grip and an adjacent slot in the center of the cap, so that the cans can be connected together in any desired manner, for example one atop the other and/or across each other, to provide a multiplicity of construction configurations.

3,815,282
AMUSEMENT DEVICE HAVING INTERCHANGEABLE COMPONENTS

Lynn Marie Frost, 512 E. Parkway, Appleton, Wis. 54911

Filed Aug. 30, 1972, Ser. No. 284,873
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 3 Claims

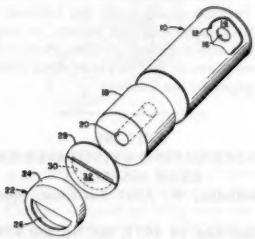


An amusement device of the take-apart and put-together type comprises a plurality of semi-circular, nestable multi-colored components, each having a hole therein, which can be assembled in various ways. Some or all of the components may be layed on a flat horizontal surface and arranged in concentric circles or semicircles or in an end-to-end sinuous arrangement. Or, some or all of the components may be arranged on the rod, when the latter is vertically disposed, as concentric circles or semicircles, each lying in a different vertical plane.

3,815,283
DIAPHRAGM-TYPE GAME CALLER

Frank R. Piper, Delmont, Pa., assignor to Penn's Woods Products, Inc., Delmont, Pa.

Filed Jan. 18, 1973, Ser. No. 324,735
Int. Cl. A63h *5/00*
U.S. Cl. 46—178 4 Claims



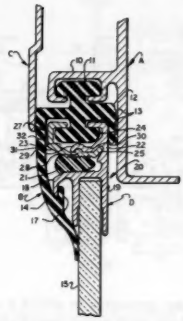
A diaphragm-type wild game caller is formed by a tubular housing having a wall at one end with a circular opening therein. A tubular pad in the housing is retained therein by an end cap. An opening in the cap exposes a diaphragm assembly which includes a diaphragm member carried by a plate arranged between the cap and the housing.

3,815,284
RELEASABLE HINGE MOUNT FOR WINDOW

Theodor Schubach, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 21, 1972, Ser. No. 308,521
Int. Cl. E06b *7/18*
U.S. Cl. 49—466 7 Claims

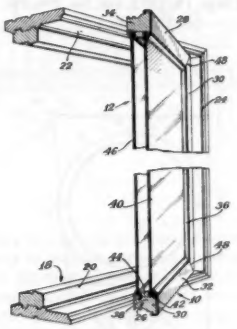
An inverted, metal channel member is fitted and bonded onto the upper edge of a glass panel window for a transportation type vehicle. An upward extension on the channel has a laterally bent upper end for engagement with one side of a continuous, resilient hinge member extending along the upper edge of a window opening. A metal locking strip has one edge thereof shaped for releasable engagement with the channel member, and its opposite edge bent to engage the opposite side of the hinge member. An insert strip, fitted between the locking strip and the channel member, retains the locking strip in position, and causes the latter, and the bent upper end of the channel extrusion, to grip the hinge member therebetween to suspend the window therefrom. Removal of the insert strip frees the locking strip and thereby releases the window from the hinge.



3,815,285
COVERED WINDOW SASH AND METHOD FOR MAKING THE SAME

Herman S. Kuyper, Knoxville, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed May 3, 1972, Ser. No. 249,848
Int. Cl. E06b *3/00*
U.S. Cl. 49—501 11 Claims



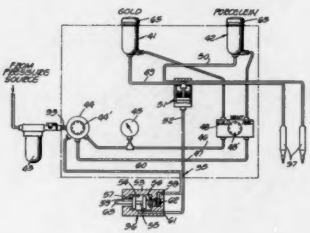
A clad or covered window sash and a method for making the same. Aluminum panels are permanently mounted so as to cover the exterior portions of a wood window sash. The aluminum panels are coextensive with the rails and stiles which define the sash. The panels include hook portions on both of their outer edges which engage with edge portions provided on both the inner and outer peripheries of the wooden sashes and stiles. The metal panels are secured to each of the rails and stiles of an assembled wooden sash without any fasteners and they are snapped into position over the exterior portion of each of the stiles and rails.

3,815,286

PNEUMATIC ABRASIVE CUTTING APPARATUS

Meyer Piet, Arcadia, Calif., assignor to Futurecraft Corporation, Industry, Calif.

Filed Nov. 1, 1971, Ser. No. 194,194
Int. Cl. B24c 3/00
U.S. Cl. 51—12 7 Claims



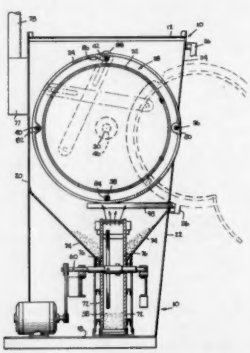
Abrasive cutting apparatus in which a mixture of abrasive particles and a fluid, such as air, under pressure, are expelled at high speed from a nozzle, a compartmented housing being utilized to provide a working compartment connecting directly with a suction compartment, and an isolated control compartment for the abrasive reservoir or reservoirs and associated control components which are supported for removal as a unitary assembly. Means are provided for utilizing the pressurized fluid for fluffing up the abrasive powder in the reservoir to facilitate feeding to the nozzle, and to prevent clogging or packing in the reservoir. A pneumatically actuated pinch valve controls flow of air and the carried abrasive powder to the nozzle through a tubing of a material, such as latex, which prevents tunneling, and manually operable valve means provides for reservoir selection and venting.

3,815,287

WORKPIECE TREATMENT MACHINE WITH DISCHARGE MEANS

Helen H. Walker, 607 Charlton St., Valdosta, Ga. 31601

Filed Sept. 19, 1972, Ser. No. 290,392
Int. Cl. B24b 3/26
U.S. Cl. 51—13 13 Claims



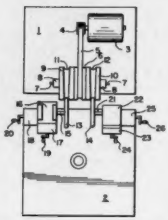
A workpiece treatment machine wherein a workpiece holding basket is retained between a pair of rotatable support elements and wherein said basket is pivotally connected to the elements near its periphery and otherwise releasably connected to the support elements so that as they are rotated in a particular direction the basket will roll out from the machine for treatment.

3,815,288

PATTERN MACHINING SYSTEM FOR DIE ROLLS

Harold R. Wilson, Wilmington, N.C., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 76,653, Sept. 28, 1970. This application Aug. 10, 1972, Ser. No. 279,363
Int. Cl. B24b 1/00, 17/02
U.S. Cl. 51—35 28 Claims



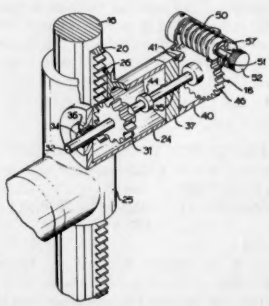
A system for the machining of work pieces, particularly the abrading of die rolls for a tube reducing mill, where the work piece and the master pattern or cam are mounted for rotation on a common shaft and moved relative to a master follower and rotating tool, respectively, with this relative movement being biased translation with only the angle of the translation varying with respect to the axis of rotation for causing the follower to traverse the entire control surface of the master and correspondingly cause the tool to duplicate the master control surface in the work piece. The follower and tool are mounted on a common table, which table is mounted with respect to a base for only translation, that is, the table will not rotate with respect to the separately mounted master and work piece. A slide mechanism allowing only translation of the table is rotated independently of the table to traverse the direction of table translation through an angle of 180°. Elements are provided to bias the table in the direction of translation so that with the 180° rotation of the slide, the follower will traverse the entire control surface of the master, in one plane. The master is rotated about an axis parallel above-mentioned the abovementioned plane so that its entire three dimensional surface will be engaged by the follower.

3,815,289

GEM GRINDER HAVING A PIVOTABLE RACK AND GEAR ASSEMBLY

Douglas L. Hoffman, W. 3507 LaCrosse, Spokane, Wash. 99205

Filed Aug. 14, 1972, Ser. No. 280,474
Int. Cl. B24b 9/16
U.S. Cl. 51—125.5 6 Claims



A pivotable rack and gear assembly for selectively locating and holding a geared frame at a chosen longitudinal position

along a fixed axis while allowing the frame to be freely pivoted about the fixed axis. A geared frame is held on an elongated support shaft or post for movement along the shaft axis. It engages a longitudinally stationary rack in the form of a toothed plate which is free to "float" or pivot about the shaft axis within the confines of the frame. The rack is loosely held against the periphery of the shaft within a complementary recess through the frame and is free to pivot with the frame about the axis of the shaft. The rack is prevented from moving longitudinally and therefore provides a reaction member for movement of the frame along the post in response to rotation of the gear. The meshing gear is preferably driven by a worm drive assembly mounted within the frame for fine adjustment and locking of the frame at a selected longitudinal position. The gear may be moveably supported to permit its disengagement from the rack, allowing the frame to be freely moved along the shaft. The gear may also be powered by a motor and gear drive unit. A specific application of the apparatus is directed to support a dop arm assembly in a gem faceting machine.

3,815,290

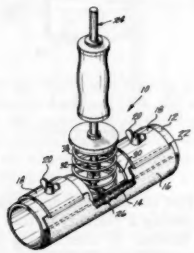
ROTARY TOOL SANDING ATTACHMENT

John E. McDowell, Raymond, Wash., assignor to Richard E. McDowell, Raymond, Wash., a part interest

Filed Oct. 26, 1972, Ser. No. 301,127

Int. Cl. B24b *23/00*

U.S. Cl. 51—170 PT **13 Claims**



A sanding attachment for a rotary drive tool such as a rotary drill includes a section of tubing having a sheet of resilient padding material attached along the bottom semi-cylindrical face thereof. Clamps secured by wing nuts are attached to each end on the top portion of the tube adjacent each end. The clamps hold a replaceable sheet of sanding material, such as sandpaper, securely against the resilient padding. A drive shaft is transversely connected to the longitudinal midpoint of the tube. The drive shaft has a flexible coupling located adjacent the tube and a flange located above the flexible coupling. A coil spring in compression bears against the bottom of the flange and the attachment point between the drive shaft and the tube to bias the flexible coupling into alignment. An auxiliary handle is rotatably mounted on the drive shaft above the flange member.

3,815,291

SANDING MACHINE FOR BOWLING ALLEYS

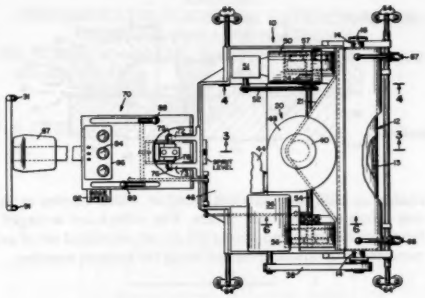
Paul Held, Rochester, N.Y., assignor to Allstate Tool and Die Inc., Rochester, N.Y.

Filed June 26, 1972, Ser. No. 266,413

Int. Cl. B24b *23/02*

U.S. Cl. 51—170 PT **4 Claims**

A sanding machine for bowling alleys including a sanding drum mounted for rotation about an axis approximately normal to the length of the alley. The drum is journalled rigidly at the front of a unitary frame which rides on a bogie on the alley and is balanced toward the rear of the bogie. The angular orientation of the frame is adjustable relative to the bogie, laterally to ensure level sanding, and also longitudinally to control the weight placed on the drum. The speed of advance



of the machine along the alley is controlled responsively to variations in the load encountered by the motor that drives the drum so that the advance is slowed whenever the drum encounters a high area that requires more sanding than an area just previously sanded.

3,815,292

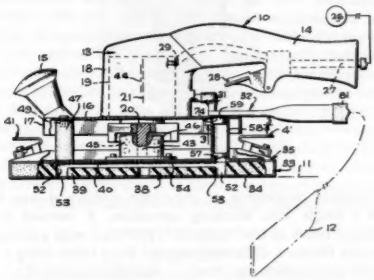
STRUCTURE AND MANUFACTURE OF ABRADING TOOL HAVING SUCTION SYSTEM

Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107

Filed Aug. 21, 1972, Ser. No. 282,457

Int. Cl. B24b *23/00*

U.S. Cl. 51—170 MT **12 Claims**



An abrading tool having an aspirator for creating a partial vacuum acting to withdraw abraded particles to a collection location. The aspirator includes a conduit forming a passage into which air and entrained particles are drawn through a predetermined opening, with air inlet means directing a primary flow of air into the passage and across the opening to induce the desired movement of the particles.

3,815,293

ROLLER SUPPORT ASSEMBLY FOR MACHINE CARRIAGE

Sylvester G. Karbowski, 1343 Quinnipiac, New Haven, Conn. 06573

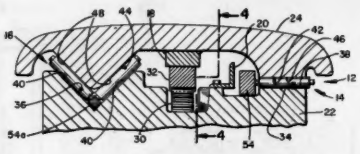
Filed Jan. 15, 1973, Ser. No. 323,976

Int. Cl. B24b *47/02*

U.S. Cl. 51—231 **10 Claims**

A machine tool has an elongated bed and includes a carriage supported for reciprocal movement longitudinally of the

bed by a roller support assembly which comprises a pair of transversely spaced and longitudinally extending roller units positioned between the bed and carriage and in rolling engagement with both the bed and carriage. Each roller unit includes an elongated support member which carries at least one group of cylindrical rollers. The rollers are arranged in longitudinal series and journalled on an associated set of axles mounted in cantilever position along the support member.

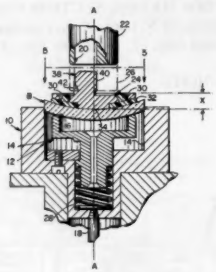


3,815,294

METHOD FOR MAKING ONE-PIECE MULTIFOCAL LENSES

Paul Martiros, Cherry Valley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 26, 1972, Ser. No. 266,189
Int. Cl. B24b 1/00
U.S. Cl. 51—284 5 Claims



Complete processing of one-piece multifocal lens blanks with a single lens blocking operation. A molded or cast meniscus blank of lens material is provided with a plurality of optically finished, differently curved focal fields using a single carrier upon which the blank is initially blocked. The single carrier supports the blank during all operations of forming and finishing the focal fields which are separated from one another by a straight cliff-like line of division extending completely across the blank.

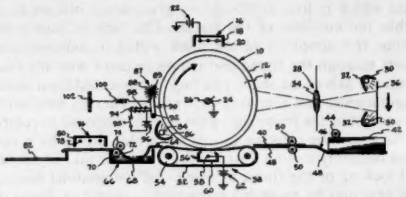
3,815,295

PROCESS FOR TREATING PHOTOCONDUCTORS

Willi Lanker, Zumikon, Switzerland, assignor to A.G. Turlabor, Zurich, Switzerland

Filed Aug. 2, 1971, Ser. No. 168,224
Int. Cl. B24b 1/00
U.S. Cl. 51—289 R 8 Claims

A process for regenerating a photoconductive layer which has been utilized in an electrographic process wherein the layer is regenerated by removing surface particles of the layer from the remainder of the layer. Abrading the layer to remove the surface particles of the layer is the preferred embodiment of performing the process of the present invention. The regeneration can be performed prior to the formation of a latent electrostatic image in an electrophotographic duplicating process. The process of the present invention is especially useful with layers containing organic materials and also when incorporated in an electrophotographic process which includes forming a latent electrostatic image on a surface and transferring the latent electrostatic image from that surface.

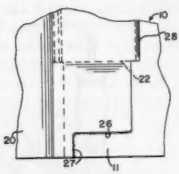


3,815,296

SEAMED JOINT FOR RAILWAY CAR ROOF SHEETS

Calvin Crutcher, Hammond, Ind., assignor to Stanray Corporation, Chicago, Ill.

Filed Jan. 16, 1973, Ser. No. 324,160
Int. Cl. B61d 17/12
U.S. Cl. 52—45 3 Claims



A galvanized roof structure for application to a freight car by welding and having a plurality of roof sections joined by clinched seams formed by interlocking hook flanges. The seam is sealed by a suitable sealant.

A method is disclosed wherein the sealant is applied prior to tightly clinching the seam.

3,815,297

CONSTRUCTION OF TRAVELING BUILDING

Yves Pasquier, Les Lilas n° 11, Residence Charcot Spanel, Cherbourg, France

Filed Sept. 25, 1972, Ser. No. 291,544
Claims priority, application France, Sept. 24, 1971, 71.34397
Int. Cl. E04b 1/343
U.S. Cl. 52—64 9 Claims

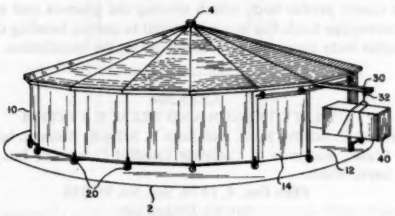
A trailer for transporting a stack of roof elements and for subsequently supporting the roof elements in edge-to-edge relationship in essentially a single horizontal plane, said trailer comprising a generally horizontal rectangular platform carry-

ing an upstanding pillar at each of at least two adjacent corners; a support arm pivoted at one end to the upper end of each pillar for swinging movement in a horizontal plane between an at-rest position parallel to the platform and a working position in which the two arms are at right angles to the platform and parallel to each other so that roof elements may be inserted between the arms, each arm being provided with at least one lengthwise support groove for slidably receiving and supporting a cooperating part of each of a plurality of roof elements.

3,815,298
ROTATABLE MULTI-PURPOSE BUILDING

Ralph E. Pope, Titusville, Fla. 32780

Continuation-in-part of Ser. No. 75,313, Sept. 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 878,807, Nov. 21, 1969, abandoned. This application May 4, 1973, Ser. No. 357,265
Int. Cl. E04b *1/346*
U.S. Cl. 52—65 **1 Claim**

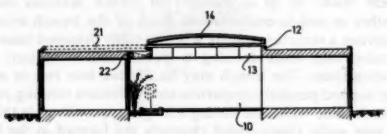


A rotatable storage building consisting of a roof supported in part at its center on a vertical post, and a surrounding wall depending from the periphery of the roof and extending downwardly approximately to a fixed floor or ground where its lower edge rests on wheels which co-operate with the central post to support the load of the roof and wall and loads on a horizontal hoist which extends from the center of the building to and outwardly from the wall through a door in the wall. The building may be rotated by manual or power means to position the door and hoist at any desired location.

3,815,299
SLIDING ROOF FOR A SKYLIGHT OPENING PROVIDED IN A BUILDING OR OVER A COURT ENCLOSED ON ALL SIDES

Sven Ake Lennart Sorensen, Ramlosabrunn, and Georg Valentin, Helsingborg, both of Sweden, assignors to Hoganas AB, Hoganas, Sweden

Filed June 7, 1972, Ser. No. 260,578
Claims priority, application Sweden, June 11, 1971, 7572/71
Int. Cl. E04b *7/16*
U.S. Cl. 52—66 **5 Claims**

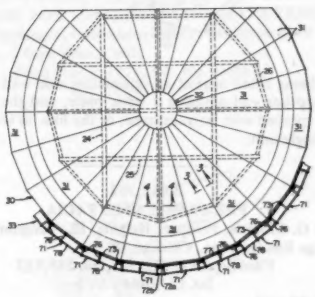


A sliding roof for a skylight opening provided in a building or over a court enclosed on all sides, and having a surrounding rim comprises a roof panel supported by a rectangular girder frame and is guided for movement between open and closed positions. On the rim there is provided an outwardly projecting flange and the girder frame is extended below this flange and projects under the flange to form together therewith a labyrinth seal.

3,815,300
PREFABRICATED FLIGHT DECK STRUCTURE FOR OFFSHORE DRILLING PLATFORMS

Billy R. Bain, Arvada, Colo., assignor to Levingston-Armadillo, Inc., Arvada, Colo.

Filed Nov. 22, 1971, Ser. No. 200,886
Int. Cl. E04b *5/43*
U.S. Cl. 52—73 **16 Claims**



A prefabricated flight deck is mounted on a framework above an offshore drilling platform to accommodate the landing of aircraft thereon. The flight deck has a plurality of lightweight honeycomb-type panel sections each formed of outer and inner skin members with honeycomb core and reinforcing beams sandwiched between the skin members and provided with lift stations. The panel sections are united together at complementary stepped joint surface areas which are both adhesively joined and mechanically fastened at spaced intervals to form an integral unit which is covered with an outer protective layer forming a sealed non-porous top surface. In a preferred form the deck is generally polygonal in shape and the panel sections are pie-shaped and extend radially with truncated inner ends thereof forming a central opening. A round center panel section fills the center. A safety fence projects outwardly from the outer ends of the panel sections for added surface area beyond the prefabricated deck.

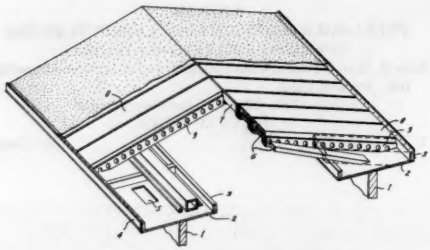
3,815,301
BUILDING ROOF, AND THE METHOD OF CONSTRUCTING SAME

Franklin Beard, and Nelson E. Schwartz, both of 11710 Old Main Loop, Houston, Tex. 77025

Filed June 7, 1971, Ser. No. 150,444
Int. Cl. E04b *7/02*
U.S. Cl. 52—92 **3 Claims**

A building roof formed of preformed and precast beams to be mounted on a roof framework, the beams, formed of fiberboard channels in which foamed polyurethane, or the like, is deposited, are mounted in parallel relation with longitudinal reinforcing members between the beams, said reinforcing members being perforated transversely, and said beams resting at one end on a soffit, said soffit being formed of panels wide enough to provide an overhanging eve outside of the building wall and an area inside the building wall for mounting air conditioning conduits, wires, pipes and the like, said beams being bonded in a single unit by means of a sealant; and the method of forming a roof wherein fiberboard channels are formed in which a foam material such as polyurethane is deposited to form channel beams, supported by a framework having one end in vertical alignment with the outside wall of

the building, and longitudinal reinforcing means mounted between each beam, said reinforcing means being of less width than the side wall of the beam, so that a stapling area is left to anchor the beams in abutting relation and one end of the



beams being fitted against an upstanding side wall of a soffit and the other end abutting a ridge plate, and the entire assembly sprayed with polyurethane, or the like, to seal the roof into a single unit.

3,815,302

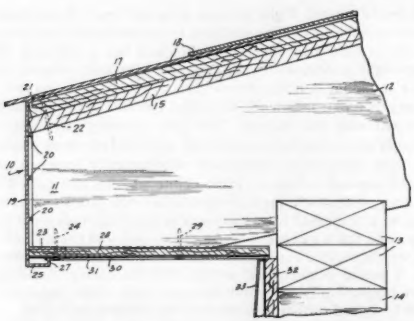
PRE-FABRICATED FACIA

Donald G. Monroe, Prospect Heights, Ill., assignor to Active Garage Builders, Inc., Chicago, Ill.

Filed Sept. 1, 1972, Ser. No. 285,932

Int. Cl. E04d *13/15*

U.S. Cl. 52—94 **3 Claims**



Prefabricated facia in strip form, viz. extruded aluminum, has a reinforced body panel to be disposed in closing relation along the ends of rafter tails with a flashing and attachment flange along the upper edge of the body panel overlying the edge of roof sheathing on the rafters and underlying roof covering such as shingles. Along its lower edge the body panel has an attachment flange to underlie the rafter tails and provided with a soffit channel in which a margin of a soffit panel is adapted to be engaged. To connect adjoining edges of soffit panels, a joint connector bar is provided.

3,815,303

PROFILE STRIP FOR THE MOUNTING SUPPORT OF FIXEDLY INSTALLED PANES

Hermann Ziegler, Renningen, Germany, assignor to Dr. Ing. h.c.F. Porsche KG, Stuttgart-Zuffenhausen, Germany

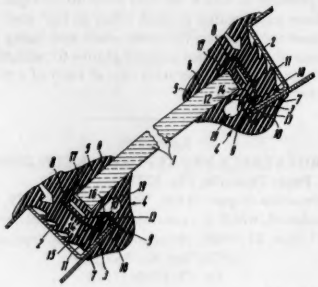
Filed Apr. 21, 1972, Ser. No. 246,180

Claims priority, application Germany, Apr. 22, 1971, 2119617

Int. Cl. E06b *3/62*

U.S. Cl. 52—99 **34 Claims**

A profile strip serving for the mounting support of fixedly installed panes, especially of windshield panes in motor vehicles, which is provided with two mutually oppositely directed, mutually offset grooves for accommodating the edge of the pane and the edge flange of the frame for the pane; inherently



rigid clamp-like mounting brackets are thereby embedded in an elastic profile body which overlap the grooves and which interengage hook-like in a joint-point to permit bending of the profile body about this joint-point during the installation.

3,815,304

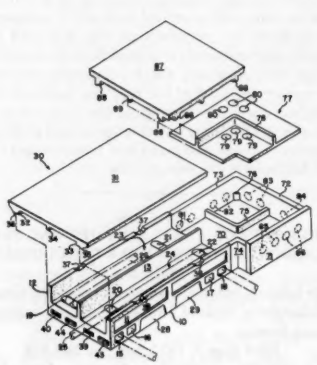
UTILITY TRENCH AND TRENCH SYSTEM

Samuel C. Schille, Kent, and John B. Schack, Auburn, both of Wash., assignors to Concrete Conduit Company, Inc., Auburn, Wash.

Filed Dec. 4, 1970, Ser. No. 95,010

Int. Cl. H02g *9/06*

U.S. Cl. 52—100 **10 Claims**



Incompatible utility lines such as power, gas and telephone lines serving urban and suburban businesses and residences are layed in separate parallel compartments of a utility trench system made up of a plurality of trench sections butted together in end-to-end relation. Each of the trench sections comprises a structure having a horizontally disposed base and upended side walls defining a trench with a bottom wall between them. The trench may be divided into two or more open topped parallel compartments by dividers running parallel to the side walls and having a height approximately that of the side walls. Open-ended channels are formed in the base directly beneath the bottom wall of the trench, the channels extending transverse to the length dimension of the trench. Knockout portions are formed in the bottom wall of each of the compartments, the knockouts defining openings through which cable layed in each of the compartments can exit the structure without crossover or chance of direct contact with

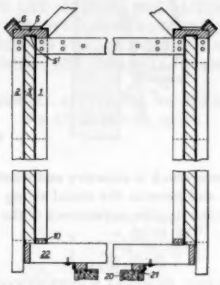
other lines layed in an adjoining compartment. A removable top whose upper surface may serve as a sidewalk seats upon the upper edges of the side walls.

3,815,305

FRAME CONSTRUCTION ASSEMBLY INCLUDING MODULE ELEMENTS FOR ERECTING BUILDINGS IN SECTIONS

Geir Grung, Sandvika; Ole Jan Skogen, Asker, and Per Hoydahl, Oslo, all of Norway, assignors to Sun House A/S Ltd.

Filed Apr. 19, 1971, Ser. No. 135,005
Int. Cl. E04b 2/72; E04c 2/40
U.S. Cl. 52—264 **7 Claims**



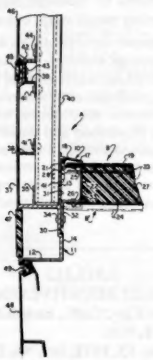
An assembly of module elements for houses and other structures, includes a plurality of slab-like wall elements which are received between pairs of stanchions which serve as a two-sided support for the wall elements. Horizontal thrust elements which extend transverse to the wall elements are each joined to the stanchions by a splice plates that extend through a slot in the inner stanchion.

3,815,306

SIDE WALL TO FLOOR JOINT FOR TRANSPORTATION TYPE VEHICLE

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jan. 22, 1973, Ser. No. 325,760
Int. Cl. B62d 27/02; E04b 5/10
U.S. Cl. 52—285 **9 Claims**



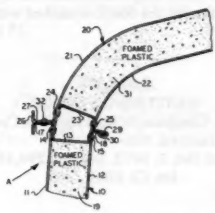
Each pre-fabricated side wall of a transportation type vehicle has a surface along the lower, inner side thereof for seating thereto the laterally outer edge of a channel embodied in each side of the vehicle floor structure. An inclined locking flange is provided along an upper portion of each such side wall surface, and receives a tapered rib provided along the upper side flange of each floor channel. A masking flange extends laterally inwardly beyond the locking flange and bears on an edge portion of the vehicle floor covering. A flange on the lower side flange of each floor channel seats to each such side wall surface and is riveted or otherwise fastened thereto to complete the joint. A jacking ledge along a lower portion of such surface provides support for a tool used for jacking the tapered rib to interlocked condition with the locking flange.

3,815,307

ROOF-TO-SIDEWALL UNIT METHOD JOINT STRUCTURE FOR TRANSPORTATION TYPE VEHICLES

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed May 5, 1972, Ser. No. 250,634
Int. Cl. B62d 31/02
U.S. Cl. 52—285 **5 Claims**



The roof structure of a ground transportation vehicle is manufactured as a unit in its respective jig, complete with all components, accessories, finish and trim, as are also each of the vehicle sidewalls, the latter preferably complete with seats of cantilever or semi-cantilever type. Each sidewall is connected to an edge of the roof structure by a joint comprising a downwardly open channel embodied in each side of the roof structure, and a cooperating, upwardly open channel incorporated in the upper edge of each side wall. Each roof structure channel is supported on, and interlockingly connected to its corresponding sidewall channel with the channels in relatively inverted, complimentary relation, and each roof-to-sidewall joint is completed by fastening means applied by workers working exteriorly of the vehicle. The relatively inverted channels along each side of the vehicle define a duct for containing cables, or as an element of an air conditioning system.

3,815,308

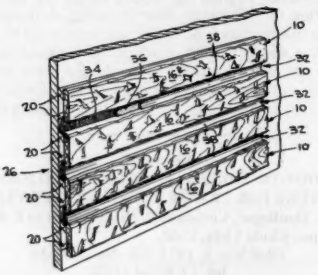
CONSTRUCTION SIDING MEMBERS

Robert A. Corey, Rt. 1, Richland Center, Wis. 53581

Filed May 11, 1972, Ser. No. 252,289
Int. Cl. E04c 2/26
U.S. Cl. 52—316 **4 Claims**

A novel construction siding member as well as a technique of manufacturing same is disclosed, the construction siding member effecting a decorative rustic appearance. In the preferred inventive embodiment, the construction siding member is adapted for attachment to an underlying wall and comprises a generally planar elongated board having elongated depending strips secured to the rear face thereof, such strips having their edges cut at an acute angle to facilitate nailing of the elongated board to the underlying wall with the nails being hidden when viewing the front face of the board. The board itself is distressed to provide a rustic appearance. An entire wall can be formed from such siding members by providing a plurality of same in spaced-apart parallel relation-

ship to one another with the space between each siding member being filled with mortar. The technique for distressing each siding member to effect the rustic appearance includes the steps of chopping the edges of the board with an ax-

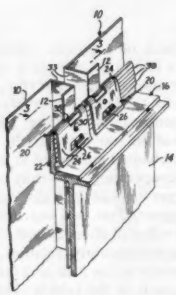


like tool, whereafter the face of the board is scored to loosen chips therefrom, such chips are removed by scraping the board face, and, finally, the board is stained with a pressurized spray.

3,815,309
FASTENING SYSTEM

Robert W. Olsen, Chatham, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Oct. 2, 1972, Ser. No. 294,163
Int. Cl. E04b *1/40*
U.S. Cl. 52—489 **8 Claims**



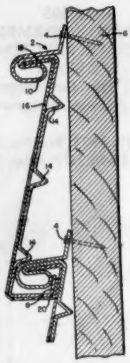
A fastening system for use in securing elongated panels having mounting flanges to mounting members comprises a support member carried on the mounting member and having a portion engaging a portion of each panel member flange in face-to-face relation. A generally U-shaped clip clamps each panel member flange and the support member portion between its legs. The panel member flange extends through a slot in one leg of the clip. The other leg of the clip has a lug protruding into the space between the legs that is captured under a projection on the back of the support member.

3,815,310
CORRUGATED METAL SIDING WITH LOOSE PLASTIC FILM FACING

Gerald Kessler, 388 Cranberry Rd., Boardman, Ohio 44512

Filed Sept. 15, 1972, Ser. No. 289,251
Int. Cl. E04d *1/18, 1/22*
U.S. Cl. 52—531 **3 Claims**

An architectural siding for buildings is composed of metal siding strips which are corrugated for strength, the corrugations being concealed by a thin film of flexible plastic sheeting preferably secured to the siding only at unexposed edges or areas; this conceals the corrugations and presents a smooth



surface appearance which is attactive and weatherproof, does not show dents, and permits the metal siding to expand and contract without marring the appearance of the siding.

3,815,311
INTERLOCKING, SERIALLY INTERCONNECTING, EXTRUDED BUILDING BLOCK MODULES FOR WALLS, FLOORS, CEILINGS, ETC.

Ero V. Nisula, and Waino W. Nisula, both of 1806 Princeton Dr., Clearwater, Fla. 33515

Filed Mar. 30, 1972, Ser. No. 231,462
Int. Cl. E04c *2/08*
U.S. Cl. 52—579 **1 Claim**

This invention pertains to modular building blocks of extruded aluminum, having metal snap, extremely strong, interlocking means of a unique configuration, such modules taking the form of walls, floorings, ceilings, bricks, etc. for varied use in building structures. These modules may be arranged serially to form planks, walls, ceilings, etc., wherein the length, width, size, etc., may be varied in accordance with its intended use. The particular means illustrated and described hereinafter for connecting the various sections or modules together comprise the most important feature of the invention. Also included are corner post arrangements for facilitating the serially connected modules in the many vertical structures contemplated for its use.

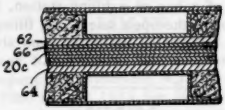
3,815,312
BULLET RESISTIVE DOOR

Robert Lench, Culver City, Calif., assignor to American Standard Inc., New York, N.Y.

Filed Mar. 13, 1972, Ser. No. 233,999
Int. Cl. E04c *2/08*; E04b *2/02*
U.S. Cl. 52—622 **1 Claim**

A bullet-resistive door having a relatively thick heavy armor plate within the door interior, and a series of channel reinforc-

ing ribs adhered to opposite faces of the armor plate to prevent it from buckling under its weight or door-slamming



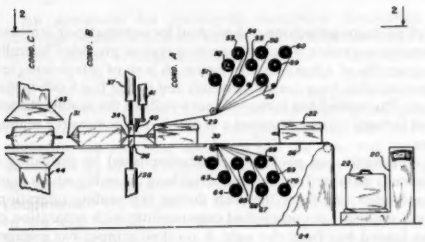
forces. The reinforcing channels also serve to locate and retain the outer door sheets in smooth, flat, non-wavy planes.

3,815,313

APPARATUS AND METHOD FOR AUTOMATICALLY SIZING AND WRAPPING A SHRINK WRAP ENVELOPE AROUND ADVANCING LUGGAGE

Raymond A. Heisler, 657 Dakota Tr., Franklin Lakes, N.J. 07417

Filed Oct. 4, 1972, Ser. No. 295,024
Int. Cl. B65b *9/02, 61/14*
U.S. Cl. 53—14 **22 Claims**



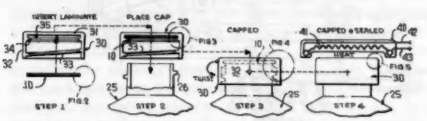
This invention pertains to the automatic sizing, weighing and wrapping of individual pieces of luggage randomly advanced on a transporting means such as a conveyor. The wrapping is a shrink wrap film whose thickness and width requirement is automatically calculated and supplied. The film is draped and peripherally sealed around the piece of luggage with the handle retained within the sealed wrapping. A handle aperture is formed in an outwardly extending portion of a double layer of film after which the film is heat shrunk to tightly enclose and protect the piece of luggage and provide an integrally attached handle.

3,815,314

PACKAGING METHOD

William J. Pollock, Glenview, and Peter Tagalakis, Chicago, both of Ill., assignors to Phoenix Closures, Inc., Chicago, Ill.

Filed Sept. 11, 1972, Ser. No. 287,825
Int. Cl. B65b *7/28*
U.S. Cl. 53—15 **11 Claims**



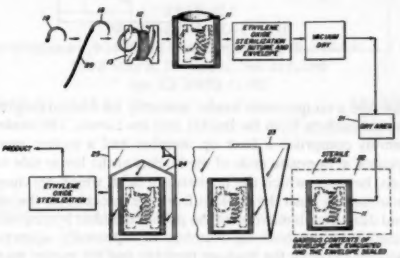
This disclosure relates to a novel packaging method which includes the steps of packaging a product into a container having a mouth defined by a lip, inserting a metallic-nonmetallic-metallic laminated liner upon the container lip in sandwiched relationship between the container lip and an end panel of an associated closure, and inducing heat in the metallic laminate sufficient to fuse one of the metallic laminates to the closure end panel and the other of the metallic laminates to the container lip. Preferably the bond strength between the other of the metallic laminates and the container lip is great enough to resist delamination upon the removal of the closure to thus provide an inner seal. Additionally, the bond strength between the one metallic laminate and the end panel is sufficiently strong to retain the non-metallic laminate with the closure upon the removal thereof whereby the nonmetallic laminate can be used for resealing purposes after the closure has been once removed from the container.

3,815,315

ETHYLENE OXIDE STERILIZATION OF MOISTURE SENSITIVE SURGICAL ELEMENTS

Arthur Glick, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 138,425, April 29, 1971, Pat. No. 3,728,839, which is a continuation-in-part of Ser. No. 788,501, Jan. 2, 1969, abandoned. This application Mar. 28, 1973, Ser. No. 345,604
Int. Cl. B65b *55/10*
U.S. Cl. 53—21 FC **3 Claims**



A dry absorbable synthetic surgical element of a polymer subject to hydrolytic degradation to non-toxic, tissue-compatible, absorbable components, such as a polyglycolic acid suture, is packaged in an air-tight sealed container which is substantially impervious to water vapor such as a laminate film having a metallic foil layer. The gaseous contents of the envelope are, prior to sealing the suture within the envelope, either evacuated or replaced with a gas which is inert towards said surgical element and which is substantially free from water. The water content should be below 0.5 percent by weight of the weight of the surgical element, and preferably is and remains below 0.05 percent by weight. Polyglycolic acid sutures and other elements thus packaged retain acceptable levels of strength for at least one year at storage temperatures of 72°F. and ambient humidity outside the package. The contents may be sterilized by using ethylene oxide.

3,815,316

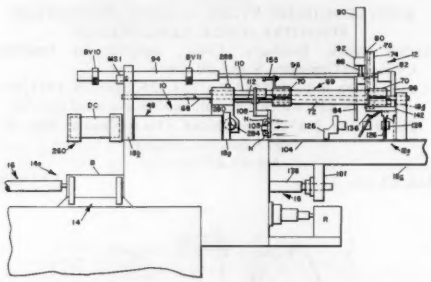
METHOD AND APPARATUS FOR LOADING TEA BAGS INTO CARTONS

Arthur Alan Brooke, Toronto, Ontario, Canada, assignor to Delamere & Williams Company Limited, Toronto, Ontario, Canada

Filed Mar. 13, 1973, Ser. No. 340,728
Int. Cl. B65b *63/02, 35/40*
U.S. Cl. 53—24 **54 Claims**

Apparatus for loading predetermined numbers of tea bags into cartons of a predetermined length comprising a rotor on which there are mounted back-to-back longitudinally extend-

ing buckets open at their opposite ends for rotation about a horizontal axis to alternately move the buckets from the upper side of the axis to the lower side thereof, and vibrators on the rotor associated with the respective buckets operable when the buckets are moved to the lower side to effect their vibration. At one end of the rotor at the level of the bucket at the upper side there is a reciprocable transfer assembly for pushing a predetermined number of packets under light pressure into the bucket at the upper side and a conveyor including selector elements for selecting a predetermined number of packets from the supply of packets and presenting them to the transfer assembly. At the other end of the rotor at the level of the bucket at the lower side there is a support for an empty open-ended carton for supporting the carton with an open end in registration with the open end of the bucket at the lower



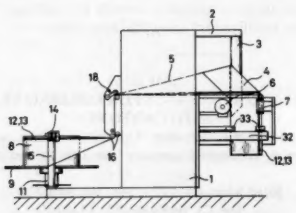
side and a reciprocable loader assembly for discharging the inverted packets from the bucket into the carton. The loader assembly comprises a back-up member and a pusher member located at opposite ends of the bucket at the lower side of the axis, between which the packets are held, which are movable in unison to push the packets from the bucket into the carton and during such movement the pusher member is reciprocated relative to the back-up member to repeatedly squeeze the packets between the back-up member and the pusher member as the loader assembly moves the packets into the carton. Motors and limit switches provide for cyclical and sequential operation of the several components so as simultaneously to advance a selected number of packets into a bucket on the rotor at the upper side and discharge a compacted column of packets from the bucket at the lower side.

3,815,317

METHOD AND MECHANISM FOR MAKING FILLED BAGS

Franco Toss, Troher Strasse 32, D-6301 Alten-Buseck, Germany

Filed Mar. 8, 1973, Ser. No. 339,038
Int. Cl. B65b *9/08, 9/10*
U.S. Cl. 53—28 **14 Claims**



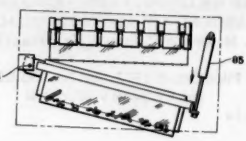
A method and mechanism for making and filling bags from a continuous film of plastic material having a mating reclosable interlocking profile along the edges wherein material is supplied on a roll with the profiles interlocked, the profiles separated and the film spread, the film folded and the profiles interlocked and the folded film cross-sealed to form a seam along one edge of a bag at a filling station, the bag filled downwardly through the open side at the filling station, and the bag finished by forming the other seam above the filled material.

3,815,318

PACKAGING METHOD AND APPARATUS

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed May 3, 1971, Ser. No. 139,453
Int. Cl. B65b *43/12, 43/36, 51/00*
U.S. Cl. 53—29 **67 Claims**



A packaging machine and method for automatic or semi-automatic operation with a bag sealing station provided laterally rearwardly of a bag loading station. A web of interconnected heat-sealable bags are successively fed to the bag loading station. The loaded bag is moved rearwardly to the sealing station and is there clamped against a heater bar by a movable sealing bar.

Automatic bag packaging is accomplished by providing a pivotally mounted sealing and detaching assembly which tears the loaded bag from the web during the sealing operation. Heat sealing is accomplished concurrently with separation of the loaded bag from the web. A toothed gripper bar engages the web above the seal to prevent separation of the web in the region of the seal and to assure separation along a preformed line of weakness spaced from the seal. As the sealing bar is released from its clamping position, the web is advanced to move a successive bag into the bag loading position.

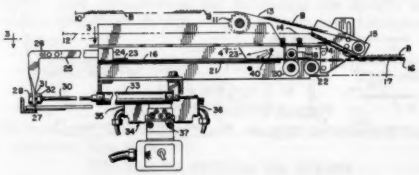
Semi-automatic bag packaging is accomplished by manually tearing the loaded bag from the web and manually inserting the bag in the sealing station. In semi-automatic operation the web is fed to advance a successive bag to the bag loading position concurrently with the sealing of a bag in the sealing position.

3,815,319

MEANS AND METHOD FOR UNFOLDING BACON BOARD FLAPS AND THE LIKE

Andrew H. Vedvik, Madison, Wis., assignor to Oscar Mayer & Co., Inc., Madison, Wis.

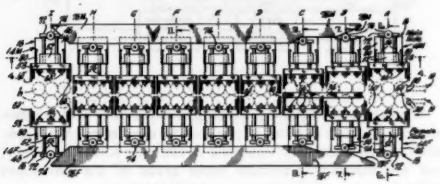
Filed Mar. 21, 1973, Ser. No. 343,346
Int. Cl. B65b *43/42*
U.S. Cl. 53—29 **10 Claims**



Apparatus and method for delivering predetermined quantities of product, e.g. sliced bacon in shingled condition, onto an

awaiting support, e.g. a bacon board, including means and method utilizing jets of air for unfolding a trailing flap on each bacon board.

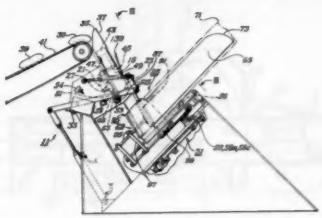
3,815,320
WRAPPING MACHINE
Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.
Filed Oct. 10, 1972, Ser. No. 296,326
Int. Cl. B65b *21/06, 21/24*
U.S. Cl. 53—48 **20 Claims**



An apparatus for packaging successive assemblies of beverage bottles, which are advanced in double row and transversely paired arrangement, the apparatus being adapted to employ a cut and scored blank of foldable sheet material which is characterized by a top wall forming panel, adjoining side wall forming panels and bottom wall forming end panels, the latter having in the free margins, locking tabs and co-operating tab receiving apertures and the side wall forming panels having small triangular end wall forming panels hinged adjacent the bottom of the end edges with bottom extension panels which are adapted to be trapped between the bottoms of the end bottles and the bottom wall in the completed package, the apparatus comprising a pair of endless conveyors traveling in a horizontal plane on opposite sides of the path of bottle assemblies which are advanced with a partially folded blank deposited on each assembly, the conveyors having mounted thereon spaced carriages supporting a plurality of fingers which are cam operated to move into engagement with the bottle and blank assemblies from opposite sides thereof so as to fold into proper position the end wall forming panels and to support the bottle and blank assemblies for advance past panel guiding and folding members which co-operate with the fingers in positioning of the bottom extension panels on the end wall forming panels and in locking the bottom wall forming panels together while the latter are drawn inwardly toward each other to insure tight engagement of the blank about the bottle assembly.

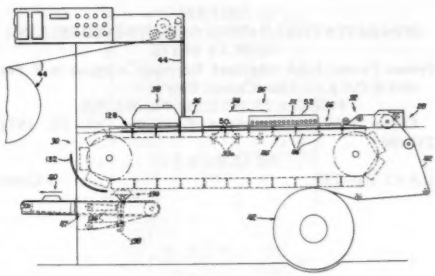
3,815,321
SEMI-AUTOMATIC PACKING OF PACKAGES
Carl C. Hartman, 415 N. Pacific, Mineola, Tex. 75773
Filed June 28, 1972, Ser. No. 267,022
Int. Cl. B65b *57/10, 57/20*
U.S. Cl. 53—61 **8 Claims**

Method and apparatus for semi-automatically packing packages being supplied by automatic packaging apparatus at a rapid rate, characterized by the steps of or means for diverting the packages sequentially into one or more chutes; accumulating the packages from all chutes on a gate; transferring the packages from the gate and in a desired position into a receiver; providing clearance in the receiver for a next package or packages transferred from the gate; repeating the above steps until a predetermined number of packages have been accumulated in the receiver and thereafter removing the predetermined number of packages to make room for the next predetermined number of packages. Specifically disclosed inventive features that are worthy of note in the invention include one or more inclined and pivotally mounted load chutes; a ram with slots; and a comb with fingers that interact with the slots to hold the bags at an advanced position as the ram is



retracted to receive the next plurality of packages from the gate, and a couple of forms of surge means enabling a single operator using the apparatus to readily handle the rapidly incoming packages.

3,815,322
PACKAGING MACHINE
Ihor Wyslotsky, 914 W. 119th St., Chicago, Ill. 60643
Filed May 8, 1972, Ser. No. 251,250
Int. Cl. B65b *31/00*
U.S. Cl. 53—112 A **15 Claims**

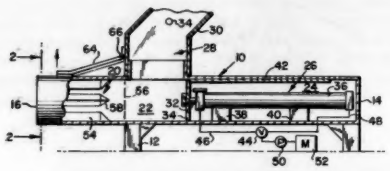


A machine for packaging articles such as meat slices; the package is formed by opposed films one of which is vacuum formed to form cavities and the other is applied thereto to complete the package; the film that is vacuum formed is heated gradually (not on-off) and substantially uniformly throughout its thickness and in the heating step, the temperature of the film is maintained at a predetermined minimum; the packages are made first in units containing two cavities and the units are perforated at a center point and the package units are nitrogen-purged at the center aperture; the films making up the packages are registered relative to a label pattern on the cover film and the cavities in the bottom film, through tension variation, under the control of a PE cell; the machine includes conveyor means intermittently advanced, the rate of speed being variable but of dwell intervals that are of predetermined length independent of the speed during travel; final cutting means includes circular friction grippers for pulling a package unit having two packages therein, and rotary cutter elements.

3,815,323
GARBAGE COMPACTOR

Joseph F. Longo, Wilton, Conn., assignor to International Dynetics Corporation, Norwalk, Conn.

Filed July 9, 1971, Ser. No. 161,122
Int. Cl. B65b *1/20*
U.S. Cl. 53—124 E 9 Claims

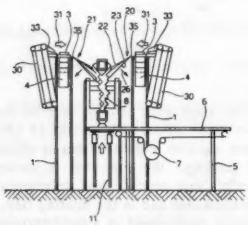


A waste compactor comprising a longitudinally extending compaction chamber, having a discharge opening at its leading end and a feed opening at its trailing end. A chute communicating with the feed opening is provided by which delivery of refuse may be made to the chamber. A horizontally moveable ram is mounted to the rear of the trailing end of the chamber and is reciprocably moveable from a first position forward of the feed opening to a second retracted position to the rear of the feedopening, thereby to successively move the refuse toward the discharge opening. At least a portion of the compression chamber located between the feed and discharge openings is provided with a plurality of elongated flutes extending substantially along the path of movement of the refuse and radially extending through the inner surface of the chamber toward the center thereof.

3,815,324
APPARATUS FOR LOADING OBJECTS INTO SELLING DISPLAY UNITS

Franco Pavese, Stadt Allendorf, Germany, assignor to P. Ferrero & C.S.p.A., Alba (Cuneo), Italy

Filed Oct. 27, 1972, Ser. No. 301,398
Claims priority, application Germany, Oct. 29, 1971, 2154064
Int. Cl. B65b *5/10*
U.S. Cl. 53—237 9 Claims

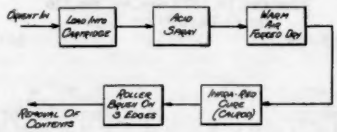


This invention provides apparatus for loading identical objects such as boxes into selling display units of the kind having recesses for receiving individual objects. The objects and the display units to be filled are moved parallel to each other, preferably on belt conveyors, and the objects are separated and move along guides into individual groups of recesses in each display unit, each display unit being moved intermittently to enable all the recesses therein to be filled at a filling station, before the filled unit is displaced on to a further conveyor.

3,815,325
MECHANISM FOR OPENING ENVELOPES

Richard F. Berger, Yonkers, N.Y., assignor to Thor Dahl, Inc., New York, N.Y.

Filed June 14, 1972, Ser. No. 262,762
Int. Cl. B65b *69/00*
U.S. Cl. 53—381 R 29 Claims

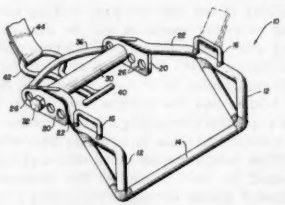


A machine for opening envelopes chemically which automatically loads a number of pre-treated envelopes onto a specially constructed tray; applies a developing solution thereto; and mechanically separates those areas of the envelopes which have been treated to open the envelopes.

3,815,326
ADJUSTABLE TRIGGER BIT

Franklin Christensen, Box 1276, Chadron, Nebr. 69337

Filed Dec. 14, 1972, Ser. No. 315,041
Int. Cl. B68b *1/06*
U.S. Cl. 54—8 3 Claims



An adjustable trigger bit mechanism for training and reducing injury to mouths of horses having a pair of plate elements, a rotatable rod mounted from the plate elements, and a trigger element supported from the rod so that that the trigger element engages with the horse laterally between the jaw bone for affecting substantially maximum control by the adjustable bit apparatus.

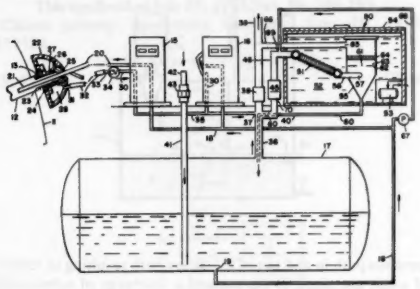
3,815,327
METHOD AND APPARATUS FOR PREVENTING LOSS OF HYDROCARBONS TO ATMOSPHERE

Clare Kenneth Viland, P.O. Box 284, Bodega Bay, Calif. 94923

Continuation-in-part of Ser. No. 289,757, Sept. 15, 1972, abandoned. This application May 14, 1973, Ser. No. 360,143
Int. Cl. B01d *50/00*
U.S. Cl. 55—80 17 Claims

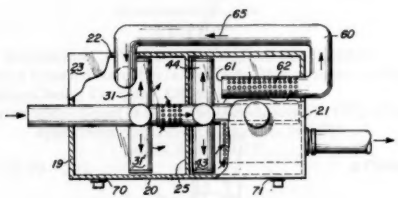
A self-contained vapor recovery system for gasoline service stations and for similar applications. Displaced hydrocarbon gases are collected at the point of entry when a vehicle's fuel tank is being filled, or when the service station's main storage tanks are receiving a fresh loading of gasoline. These vapors are collected under controlled pressure conditions, dehydrated, and passed through a refrigerated condensation or absorption zone, and the recovered liquid is returned to the service station's storage tankage, preferably below the liquid level there. The essentially hydrocarbon-free gas, now mainly air, is discharged into the atmosphere. The invention not only

helps conserve a valuable natural resource, the petroleum from which the gasoline is made, but also alleviates air pollution or smog formation, since unburned hydrocarbons in the earth's atmosphere react under the influence of sunlight with



nitrogen oxides and carbon monoxide from any source of combustion, to form a typical smog blanket. Being compact, the apparatus occupies little valuable space in a service station; and it requires less power than conventional apparatus.

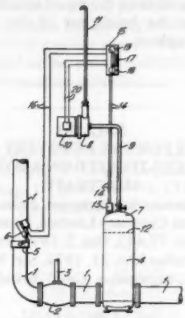
3,815,328
EMISSION CONTROL MUFFLER MEANS AND METHOD
William A. Moss, P.O. Box 2552, Lafayette, La. 70501
Filed July 3, 1972, Ser. No. 268,683
Int. Cl. B01d *47/02*
U.S. Cl. 55—93 **9 Claims**



A plural compartment enclosing housing carries a baffle and filtering media in liquid form in each compartment. Combustion exhaust gases are passed to a first compartment through said liquid and subsequently to said second compartment. Baffling and filtering occurs in the liquids of each compartment. Means then permit filtered exhaust gas to be exhausted from the second compartment with a portion thereof along with entrained liquid passing through a flowback device to the first compartment. A stationary liquid reservoir is established in each compartment. Pollutants are rapidly and efficiently removed from the combustion exhaust gas making the device highly useful in automobile and truck applications in place of conventional mufflers.

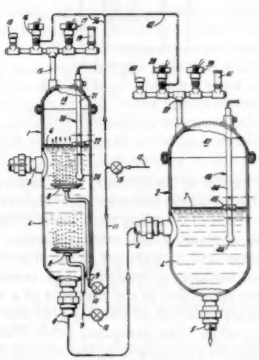
3,815,329
SYSTEM FOR UNLOADING OIL
Henrik Pande-Rolfsen, Snaroya, Norway, assignor to Thune-Eureka A/S, Oslo, Norway
Filed May 14, 1973, Ser. No. 359,895
Int. Cl. B01d *19/00*
U.S. Cl. 55—163 **2 Claims**

A separator tank for separating air from oil in an oil unloading system is provided with a pressure sensitive device connected to means for maintaining a predetermined pressure in the tank by controlling an adjustable valve on the discharge



side of a pump, the inlet side of which being connected to the separator tank.

3,815,330
APPARATUS FOR REMOVING OXYGEN FROM LIQUIDS
Clyde Murrell Lawley, 1008 Heidi Ave., Modesto, Calif. 95350
Filed Feb. 22, 1973, Ser. No. 334,736
Int. Cl. B01d *19/00*
U.S. Cl. 55—168 **10 Claims**



An apparatus—for removing oxygen from a pressure-fed, continuously-flowing liquid food product by the method of stripping the oxygen from the liquid by nitrogen—comprising, in a first stage, a close-to-atmosphere receptacle through which the liquid flows, the receptacle providing a headspace above a normal surface level of the liquid in the receptacle, means to disperse nitrogen into the liquid for upward transition therein, certain of the resultant oxygen-nitrogen gas mixture gassing off from or escaping the liquid and accumulating in the headspace, and instrumentalities associated with the receptacle operative to vent the accumulated gas mixture in the headspace to atmosphere in response to the liquid in the receptacle falling below said normal surface level and to introduce nitrogen under pressure into the headspace in response to the liquid in the receptacle rising above such normal surface level, whereby in either event to cause return of said surface level to normal.

In a second stage, connected in series to the first stage, the apparatus includes another closed-to-atmosphere receptacle likewise providing a nitrogen-inerted headspace above a nor-

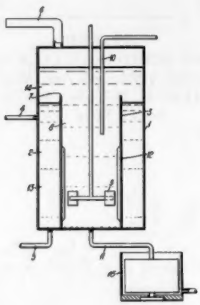
mal surface level of the liquid in said other receptacle; the latter having separate instrumentalities associated therewith and of like function as those related to the first stage of the apparatus, whereby the remainder of the oxygen-nitrogen mixture, which gasses off from the liquid in said other receptacle, is accumulated in the headspace of the latter and vented therefrom to atmosphere.

3,815,331

APPARATUS FOR THE RECOVERY OF MICRO-ORGANISMS CULTIVATED ON A HYDROCARBON SUBSTRATE

Jean Claude Hondermark, Martigues, France, assignor to The British Petroleum Company Limited, London, England

Division of Ser. No. 77,442, Oct. 2, 1970, Pat. No. 3,738,488.
This application Nov. 21, 1972, Ser. No. 308,440
Claims priority, application Great Britain, Oct. 10, 1969, 49884/69
Int. Cl. B01d *19/02*
U.S. Cl. 55—178 **2 Claims**



Apparatus for use in the recovery of a micro-organism cultivated on a hydrocarbon substrate. The feature of apparatus being the provision of a settling zone wherein the aerated cultivated broth containing the micro-organism undergoes a phase separation and a relatively dense fraction containing spent aqueous medium is removed. The remaining aerated fraction is then subjected, in the presence of a wetting agent, to foam breaking agitation, preferably provided by the action of a rotating paddle. The deaerated broth fraction thus obtained can then be centrifuged in the normal industrial centrifuges to separate a micro-organism rich product.

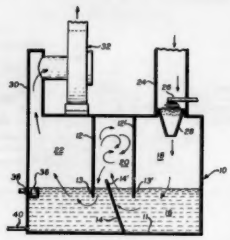
3,815,332

GAS SCRUBBER AND METHOD

Charles A. Bobrowsky, Rego Park, and Joseph A. Loise, Queens Village, both of N.Y., assignors to Double B Construction & Incinerator Upgrading Co., Inc., Brooklyn, N.Y.

Filed Mar. 28, 1972, Ser. No. 238,767
Int. Cl. B01d *47/02*
U.S. Cl. 55—223 **5 Claims**

A gas scrubber is disclosed and includes a housing which contains a water bath and a pair of spaced apart baffle means which extend below the level of the water bath at their lower ends and divide the interior of the housing above the water bath into a receiving zone, a turbulent zone and a discharge zone. A third baffle means extends from the bottom of the housing and ends above the level of the water bath between the pair of baffle means. The arrangement of the housing and baffle means in connection with the water bath is such that gas containing entrained solids is passed through the scrubber in a



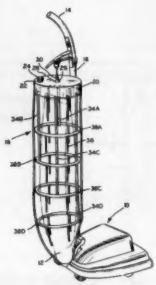
tortuous path in and out of the water bath resulting in removal of solids entrained in the gas and a discharge of substantially clean gas.

3,815,333

DAMPENING UNIT FOR AN ELECTRIC VACUUM SWEEPER BAG

Alice E. Rhodes, Toledo, Ohio, assignor to George R. Royer and Gordon M. Huffman, both of Toledo, Ohio, part interest to each

Filed June 1, 1973, Ser. No. 366,248
Int. Cl. B01d *47/00*
U.S. Cl. 55—233 **1 Claim**



A dampening unit to reduce dust emission from the sweeper bag for an electrically operated vacuum sweeper, said unit adapted for disposition around the sweeper bag, and comprising an external skeletal network of tubular members depending and connected to a water container located at the top of the sweeper bag, the first of such tubular members being a series of horizontally disposed tubular rings aligned parallel to one another in a succession of imaginary planes intersecting at spaced intervals the central longitudinal and vertical axis of the sweeper bag; the second set of such tubular members being vertically depending tubular connections each of which connect the water container with a respective horizontal tubular member; a third set of finely perforated members which depend vertically downwardly from the horizontal tubular members to carry and disperse water on the sweeper bag; through which tubular connections water placed in the water container can seep downwardly in a controlled manner into the horizontal tubular members and thence into the vertically disposed perforated tubular members to reach the fabric material of the sweeper bag in order to dampen it.

3,815,334

GAS-LIQUID CONTACT DEVICE

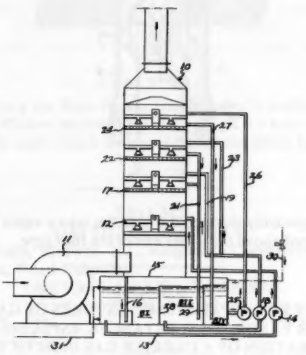
Wolfgang Kotting, Koblenz, and Erhard Zakrezewski, Nauort, both of Germany, assignors to Steuler Industriewerke GmbH, Hohr-Grenzhausen, Germany

Continuation of Ser. No. 132,417, April 8, 1971, abandoned. This application July 20, 1973, Ser. No. 381,259

Claims priority, application Germany, Apr. 10, 1970, 1571786

Int. Cl. B01d *47/00*; C01b *7/08*

U.S. Cl. 55—227 1 Claim



A gas scrubber wherein the gas is forced upwardly in a column containing a series of scrubbing trays, the trays being supplied from and draining to separate sorbtion medium containers.

3,815,335

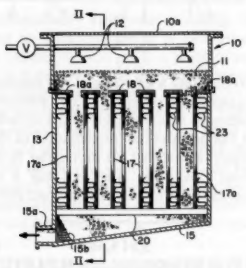
WASHED ACTIVATED CHARCOAL ADSORBERS

Herbert Leonard Barnebey, Columbus, Ohio, assignor to Barnebey-Cheney Company, Columbus, Ohio

Continuation-in-part of Ser. No. 275,564, July 27, 1972. This application Aug. 20, 1973, Ser. No. 390,011

Int. Cl. B01d *29/38*

U.S. Cl. 55—242 4 Claims



This disclosure relates to activated charcoal adsorbers for low head room applications (short height) sealed so that there is no possibility of bypassing from upstream to downstream, and fitted so that the charcoal bed can be washed with water or other fluid at right angles to the air flow. The washing is generally done as a separate operation with the air flow shut off and is for the purpose of removing acid or alkali material to minimize corrosion, removal of chemical breakdown products, or the removal of an adsorbed substance to recover it or to regenerate the charcoal so that it can be used again in adsorption service. The charging of the charcoal is done at the top and also the sprays are arranged at the top so that they can be observed, adjusted, or changed. Removal of the top cover gives ready access to the top of the charcoal cell and the sprays, permits observation of the performance of the purification system, and permits the adding of charcoal as may be needed, and the servicing of the sprays. The amount of liquid flow can be measured at the point of addition or as the liquid drains from the bottom of the adsorber.

3,815,336

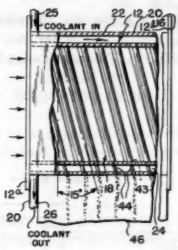
GASEOUS FLOW SEPARATOR AND HEAT EXCHANGER

H. Gregor Rigo, 333-1010 W. Green, Urbana, Ill. 61801

Filed Aug. 17, 1971, Ser. No. 172,420

Int. Cl. B01d *45/00*

U.S. Cl. 55—269 9 Claims



A gaseous flow separator and heat exchanger which has a plurality of laterally spaced filter elements extending across the gas flow, for entrapping particulate matter in the flow, and conducting the matter downwardly out of the flow path as well as conducting heat out of the gas flow, and wherein the filter elements are of a configuration which prevents the buildup of particulate material and dust on the filter elements by utilizing laterally disposed wings on the filter elements defining pockets or cavities which form vortexes in the cavities entrapping particulate material therein and moving it downwardly. Each filter element has a forwardly projecting nose portion extending forwardly of the cavities and causing gas flow to be diverged from the wing pockets.

3,815,337

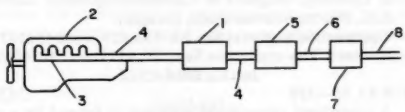
EXHAUST SYSTEM

Denis L. Lenane, Ferndale, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 879,045, Nov. 24, 1969, Pat. No. 3,688,476. This application June 23, 1972, Ser. No. 265,699

Int. Cl. B01d *50/00*

U.S. Cl. 55—276 11 Claims



Particulates are removed from a particulate-laden gas stream such as the exhaust gas from an internal combustion engine by passing the gas through a cyclone type inertial separator. The separator has particulate reject slots cut in the side wall of the cyclone chamber through which particulates are rejected into a collection chamber. The collection chamber can be filled with a porous material such as wire

mesh or expanded metal. The bottom of the cyclone chamber is a nonperforate plate. The separator can be built into a muffler. Performance is improved by including an agglomeration unit between the engine and the separator. The agglomeration unit comprises a housing inserted in the exhaust gas stream between the engine and the separator which contains a pervious mass of metal bodies such as wire mesh or expanded metal lath, or alternatively contains an alumina. Performance can be still further improved by placing a filter unit downstream from the separator.

3,815,338

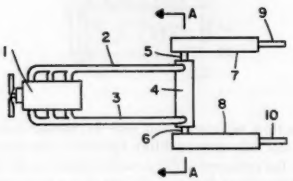
EXHAUST SYSTEM

Denis L. Lenane, Ferndale, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 265,699, June 23, 1972, which is a continuation-in-part of Ser. No. 879,043, Nov. 24, 1969, Pat. No. 3,688,476. This application Mar. 20, 1973, Ser. No. 343,103

Int. Cl. B01d *50/00*

U.S. Cl. 55—276 **15 Claims**



Disclosed herein is a system for removing particulates from engine exhaust comprising an inertial particulate trap having a cylindrical cyclone chamber with a non-perforate bottom, slots in the side wall proximate to the bottom, a guide vane in the inlet compartment forming a generally circular tunnel leading to the entrance of the cyclone chamber and a pervious exhaust conditioning material (e.g., expanded metal lath) in the tunnel. Also disclosed is an exhaust gas filter used in combination with the trap.

3,815,339

CENTRIFUGAL VAPOR-LIQUID SEPARATOR

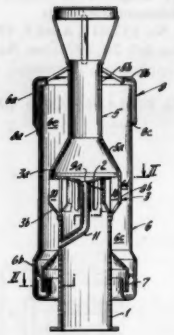
Fran Meier, Oberhausen-Sterkrade; Erich Ossendorf, Bochum, and Hubert Wolfgarten, Oberhausen-Sterkrade, all of Germany, assignors to Gutehoffnungshuette Sterkrade A.G., Oberhausen-Sterkrade, Germany

Continuation-in-part of Ser. No. 134,227, April 15, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,549

Int. Cl. B01d *45/12*

U.S. Cl. 55—338 **2 Claims**

A centrifugal vapor-liquid separator is formed by a vertically extending riser pipe closed at its upper end and laterally enclosed by a collecting shell so that a collecting space laterally surrounds the riser pipe. An impeller provided with two sets of separate passageways and located at the upper end of the riser pipe flows the vapor-liquid mixture from the riser pipe through one set of passageways into the collecting space and gives it a swirling motion. The liquid and vapor separate in the collecting space with the separated liquid exiting from the space either upwardly or downwardly along the inside wall of the shell. Vapor carried over into the collecting space below the impeller flows out through the other set of passageways extending upwardly through the impeller into a vapor discharge pipe located above the upper end of the riser pipe.



3,815,340

DEVICE FOR SEPARATING MIXTURES OF GASEOUS AND/OR VAPOROUS SUBSTANCES, ESPECIALLY FOR SEPARATION OF A CARRIER GAS IN DEVICES FOR GASCHROMATOGRAPHY

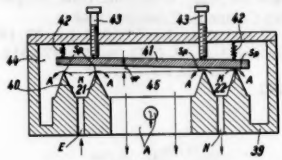
Hans-Joachim Bultemann, Walliser Strasse 94, 2800 Bremen, Germany

Filed Sept. 29, 1971, Ser. No. 184,859

Claims priority, application Germany, Oct. 1, 1970, 2048221

Int. Cl. B01d *53/22*

U.S. Cl. 55—392 **4 Claims**



Means for separating a carrier gas and vaporous substances for use in gaschromatography. The mixture of gas and vaporous substances is introduced into a separating chamber. The chamber has an inlet for introduction of the gaseous and vaporous mixture, a first exit for molecular flow and a second exit for viscous flow. The first exit has a slit width that decreases from the inlet towards the second exit.

3,815,341

FILTER FOR REMOVING SUCH PARTICLES AND MISCELLANEOUS DIRT AS CONTAINED IN A FLUID

Tatsuji Hamano, 10-7, Higashi-Sugano 1 chome, Ichikawa, Chiba Prefecture, Japan

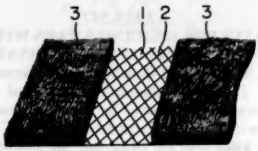
Filed Sept. 14, 1971, Ser. No. 180,414

Int. Cl. B01d *39/14*

U.S. Cl. 55—477 **7 Claims**

A filter consists of a base member, which is a coarsely woven or knitted fabric or reticulated material, with flocked fibers on the surface, the length of the fibers being between 1.5 and six times the longest diagonal line or the longest distance between the two opposite sides of the meshes. The

flocked fibers are fixed at an angle between 30° and 85°. The process of preparation consists of first applying an adhesive onto the base member, in a manner not to fill the meshes, and



then applying the flock fibers. The adhesive is preferably applied in sufficient amount to give a layer of 0.3 mm – 0.6mm, with a base cloth which is removed after the fibers have been fixed.

3,815,342

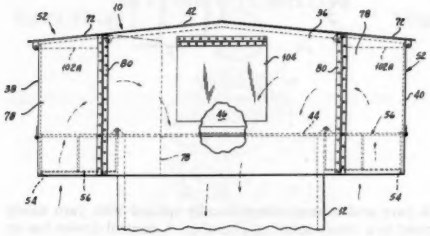
GAS FILTER ASSEMBLY

Hargus Watts, Mahwah, N.J., assignor to Curtis-Wright Corporation, Wood-Ridge, N.J.

Filed May 3, 1972, Ser. No. 249,943

Int. Cl. B01d *35/00*

U.S. Cl. 55—493 **16 Claims**



The gas filter assembly comprises a casing which has an inlet port means for receiving gas to be filtered and an outlet port means for passing filtered gas to a place of storage or use. A filter means is disposed within the casing between the inlet port means and outlet port means to disentrain solid particles entrained in the gas stream. A portion of the walls comprising the casing are pivotally connected to their fixed or associated wall portions. All of the pivot axes are located close to a common plane so that the pivotal wall portions can be rotated to a folded or collapsed position to reduce its overall size and facilitate transportation of the assembly and then unfolded or extended to its full size position for "field" or on-site erection of the assembly.

3,815,343

METHOD FOR HARVESTING GRAPES

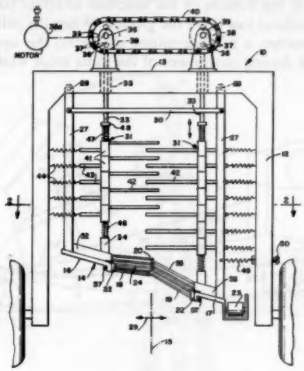
Abdul Harry Sell, Southport, N.C., assignor to Darf Corporation, Edenton, N.C.

Division of Ser. No. 178,021, Sept. 7, 1971, Pat. No. 3,772,866. This application Dec. 7, 1972, Ser. No. 312,934

Int. Cl. A01d

U.S. Cl. 56—1 **17 Claims**

A high chassis vehicle adapted to straddle and travel along a row of plants has a catcher floor divided along its longitudinal center for passing along opposite sides of the plant row. The catcher floor includes two sets of resiliently flexible brushes



which are bridged at the central floor division. Vertically reciprocable plant shakers are provided above the floor.

3,815,344

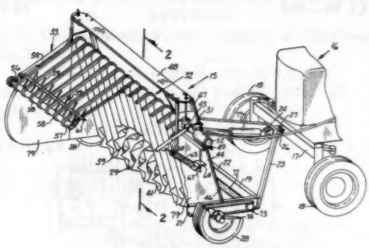
MACHINE FOR FORMING LARGE ROUND BALES OF A FIBROUS MATERIAL

Joseph B. Kucera, Traer, Iowa, assignor to Rudolph L. Lowell, Des Moines, Iowa, a part interest

Filed Nov. 29, 1972, Ser. No. 310,417

Int. Cl. A01d *75/00*

U.S. Cl. 56—341 **16 Claims**



A rotatable combination material lifting and rolling unit of the machine is advanced along a windrow of fibrous material to lift and roll the material on the ground surface to form a bale. The bale being formed is compacted by means including compacting members spaced transversely of and located forwardly of the combination unit to yieldably engage upper peripheral portions of the bale during the entire bale forming operation. On completion of a baling operation the formed bale may be left in the field for later transport to a feeding or storage station.

3,815,345

HAY ROLL FORMING MACHINE

Aquila D. Mast, Lancaster, and Edward T. Eggers, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

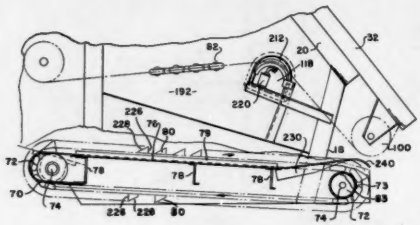
Filed Apr. 24, 1973, Ser. No. 353,947

Int. Cl. A01d *39/00*

U.S. Cl. 56—341 **7 Claims**

A machine to form compact rolls of hay of substantial size by picking up a swath or windrow of hay and the like from a

field, engage it by cooperating upper and lower endless flexible aprons driven in suitable directions to coil the hay into a compact roll while supported upon floor means mounted stationarily in the bottom of the machine to effect baling of all the hay without loss upon the ground. When the roll type bale of hay reaches a predetermined diameter, the upper apron raises and driving movement of the same stops while the bale



is discharged by movement of the lower apron rearwardly in the machine, or the machine can retain and transport the bale to a desired location, if desired. The lower course of the upper apron is initially supported in a desired configuration relative to the lower apron by guide means which include movable auxiliary means arranged to be disengaged by said upper apron when the bale reaches a predetermined diameter.

3,815,346

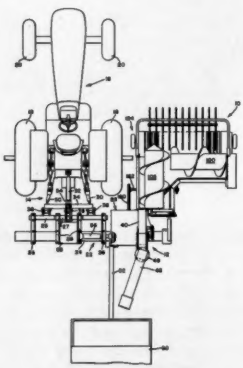
HARVESTER PICKUP

Leon Franklin Nelson, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed June 1, 1973, Ser. No. 365,988

Int. Cl. A01d *89/00*

U.S. Cl. 56—364 **16 Claims**



A tractor-mounted forage harvester has a relatively narrow, high-speed cutterhead and crop-feeding means mounted in a housing having a narrow inlet alongside the tractor and a windrow-pickup attachment removably attached to the housing for picking up a windrowed crop from the field and delivering it through the inlet. The pickup attachment has a forward, axially transverse, rotary pickup which raises the crop from the field and delivers it rearwardly to a transverse auger, which, in turn, delivers the crop to a fore-and-aft auger that moves the crop rearwardly along a fore-and-aft passage along one side of the auger through the forage harvester inlet. A baffle is provided adjacent the rear end of the fore-and-aft auger for directing the crop under the auger and into the fore-and-aft passageway. The pickup is floatable about a transverse axis and supported on a pair of gage wheels, and vertical tension springs extend between the pickup and a tooth-type compressor above the pickup to partly counterbalance the weight of the pickup.

3,815,347

APPARATUS FOR SPLICING A YARN WITH NEWLY SPUN YARN IN OPEN END SPINNING

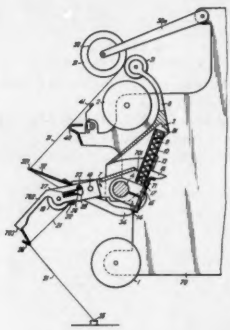
Jiri Nemec, Kostelec Nad Orlici; Ladislav Bures, Usti Nad Orlici, and Jaroslav Rajnoha, Tyniste Nad Orlici, all of Czechoslovakia, assignors to Elitex Zavody Textilniho Strojirenstvi Generalni Reditelstvi, Liberec, Czechoslovakia

Filed May 19, 1972, Ser. No. 255,051

Claims priority, application Czechoslovakia, May 24, 1971, 3772-71

Int. Cl. D01h *15/00, 1/12*

U.S. Cl. 57—34 R **13 Claims**



A yarn end is semi-automatically spliced with yarn newly formed in a rotary spinning chamber. A control device has an inserting position for guiding the yarn end by guides along a devious path, whereupon the yarn end is inserted into the spinning chamber. When the control device is manually turned to a normal position, the guides release the yarn which now extends along a shorter path between a withdrawal roller and a take-up roller which are actuated by the control device in the normal position. The slack in the yarn end facilitates the connection between the yarn end and the newly spun yarn in the spinning chamber.

3,815,348

PIVOTING DEVICE FOR TURBINE HOUSINGS OF OPEN-END SPINNING MACHINES

Friedrich Wachendorf, Eggestedt, and Rolf Wehling, Bremen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 9, 1973, Ser. No. 377,739

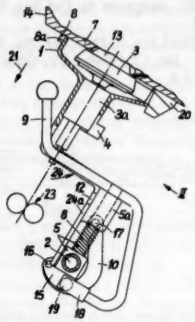
Claims priority, application Germany, July 20, 1972, 2235474

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.89 **6 Claims**

An open-end spinning machine in which the turbine housing is by means of a control lever and a crank drive operatively connected to the control lever movable along a straight path in the axial direction of the turbine housing and is provided with locking means reponsive to a predetermined stroke of the turbine housing along said straight path to lock the control

lever to the turbine housing and the crank drive whereupon the turbine housing is by means of the control lever pivotable



about a pivot shaft extending in the longitudinal direction of the machine, for yielding easy access to the interior of the turbine housing.

3,815,349

CLUTCH FOR A STRETCHING MECHANISM IS A SPINNING OR TWISTING MACHINE

Adriano Gardella, 24B, via al Capo di Santu Chiara, Genoa, Italy (16146)

Filed June 14, 1972, Ser. No. 262,698

Claims priority, application Italy, June 21, 1971, 12763/71

Int. Cl. B01h *13/16*; **D01h** *13/18*

U.S. Cl. 57—83 **5 Claims**

A clutch for a stretching mechanism in a spinning or twisting machine in which a drivable stretching roller is connected to a co-axial drive shaft by a clutch which can be disengaged by a thread monitor with the aid of a stop motion in the event of the thread breaking, wherein the clutch comprises two halves one of which carries coupling elements, such as spring-loaded balls, which can engage corresponding catch bores in the other half-clutch, and a rotatable ratchet disc with tapered apertures through the larger ends of which the coupling elements can project is disposed between the two half-clutches, the ratchet disc being arranged to be braked by the stop motion on breakage of the thread so as to force the coupling elements out of engagement with the catch bores and thereby to disengage the clutch.

3,815,350

PROCESS FOR THE PRODUCTION OF YARNS

Adriano Gardella, 24B, via al Capo di Santu Chiara, Genova, Italy (16146)

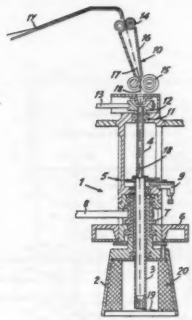
Filed Dec. 20, 1972, Ser. No. 316,728

Claims priority, application Italy, Jan. 22, 1972, 12427/72

Int. Cl. D01h *1/08*; **D02j** *1/22*

U.S. Cl. 57—167 **4 Claims**

A continuous sheet of synthetic resinous material oriented in a longitudinal direction and cut into a plurality of strands integrally joined together at regularly spaced intervals along the length thereof is continuously fed to the drafting unit of a can spinning spindle and transformed by drawing into a discontinuous fibrillated sliver, said sliver being continuously transformed into a yarn into the said spinning spindle by twisting it, and the so-formed yarn is deposited into a bobbin in the can of the can spinning spindle.



3,815,351

CALENDAR INDICATOR FOR TIME MEASURING SYSTEMS

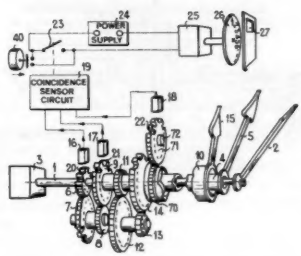
Pierre G. Vovelle, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 6, 1973, Ser. No. 330,105

Claims priority, application France, Feb. 10, 1972, 72.04507

Int. Cl. G04b *19/24*

U.S. Cl. 58—4 A **9 Claims**



The invention concerns calendar devices for watches and clocks.

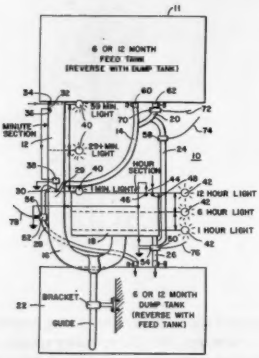
In order to obtain a precise change in the date at midnight, three movable magnetized reference are fixed to the three spindles of the hours, minutes and seconds and three fixed magnetic sensors actuate the data indicator when their three respective signals coincide in time.

The applications are in particular in the field of battery operated electronic watches.

3,815,352
MERCURY CIRCUIT CLOCK

Casper Kiesling, Glendale, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,319
Int. Cl. G04c 3/00; G04f 1/06
U.S. Cl. 58—23 R 7 Claims

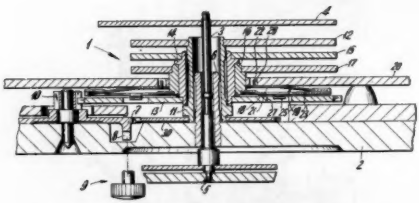


A time indicating device, particularly a mercury-circuit clock.

3,815,353
UNIVERSAL TIME WATCH

Paul Wuthrich, Watertown; Rodney W. Reder, and Joseph Rinaldi, both of Waterbury, all of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Oct. 17, 1973, Ser. No. 407,367
Int. Cl. G04b 19/22, 27/00
U.S. Cl. 58—42.5 7 Claims

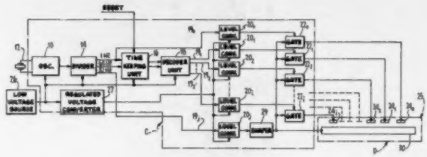


A horological device with a regular hour hand and including an auxiliary hour hand for indicating a different time zone than the local time. The auxiliary hour hand is connected to a ratchet coupling member permitting relative rotation between the regular hour hand and the auxiliary hour hand when the crown is rotated in one direction and permitting normal setting of the hour hand and minute hand, with the auxiliary hour hand moving in unison, when the crown is rotated in the opposite direction. The coupling member is normally driven by the hour wheel through a first one-way ratchet, and is held in place during setting of the auxiliary hour hand by a second one-way ratchet utilizing weak radial spring arms.

3,815,354
ELECTRONIC WATCH

Richard L. Strocka, and David F. Broxterman, both of Sunnyvale, Calif., assignors to Cal-Tex Semiconductor, Santa Clara, Calif.

Filed Jan. 2, 1973, Ser. No. 320,223
Int. Cl. G04b 3/12; G04c 3/00
U.S. Cl. 58—50 R 19 Claims

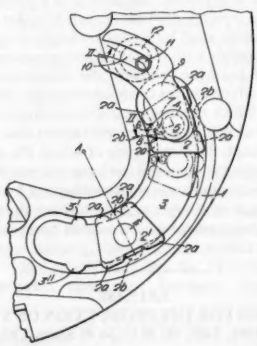


A low cost electronic time keeping and display system comprising a regulated voltage converter for converting a low voltage from a source to a relatively high voltage, an electronic time keeping system powered by the low voltage source for providing low voltage time signals, and a plurality of level converters powered by the high voltage for converting each of the low voltage time signals to a relatively high voltage of sufficient magnitude to operate an associated relatively high voltage display. The regulated voltage converter periodically samples the relatively high voltage with a short duty cycle to minimize current consumption. Each level converter has a complementary configuration which consumes current only during an extremely short switching cycle. A single chip CMOS design, low voltage and current requirements and compatibility with liquid crystal display make the invention ideal for use in a watch environment.

3,815,355
REGULATOR ASSEMBLY FOR THE FINE ADJUSTMENT OF TIMEPIECE MOVEMENTS

Jean-Claude Schneider, La Chaux-de-Fonds, Switzerland, assignor to Fabrique d'Horlogerie CHS Tissot & Fils S.A., Le Lode, Switzerland

Filed Oct. 2, 1973, Ser. No. 402,755
Claims priority, application Switzerland, Oct. 6, 1972, 14680/72
Int. Cl. G04b 17/14
U.S. Cl. 58—109 9 Claims



A regulator assembly for fine adjustment of timepiece movements comprises an index concentrically displaceable around the axis of the balance staff, such displacement permitting a coarse regulation of the active length of the balance spring. The index is in the form of a sliding block friction fitted

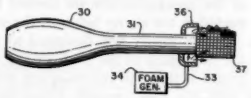
in a slot of an element of the movement frame such as a plate or a bridge and capable of being moved, the slot having the form of an arc of a circle concentric with the axis of the balance wheel. The sliding block bears a gudgeon having a pair of elements thereon defining a slot adapted to receive the balance spring, the gudgeon being pivotably movable parallel to the axis of the balance wheel. The elements of the pair are off-centered relative to the pivot axis of the gudgeon and colinear with a line passing through the pivot axis, said line in the intermediate position of the gudgeon intercepting the axis of the balance staff whereby pivoting of the gudgeon enables a fine regulation of the timepiece movement.

3,815,356

FOAM COOLING AND ACOUSTIC DAMPING OF EXHAUST GASES PRODUCED BY AN INTERNAL COMBUSTION ENGINE

Harland L. Burge, Tarzana; Bruce J. Heckert, Woodland Hills, and Newell C. Rodewald, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 10, 1971, Ser. No. 122,857
Int. Cl. B63h *11/00*
U.S. Cl. 60—204 **5 Claims**



There is disclosed a method and apparatus for providing thermal protection and acoustic damping in an internal combustion engine by means of injecting a liquid base foam into the gas boundary zone of the combustion gases. A foaming agent, a liquid, and a gas are processed to produce a high expansion foam solution. In one embodiment the foam is generated external to the combustion chamber and is supplied to a distribution manifold located at the exit end of a rocket motor. The foam is then distributed through a plurality of orifices which direct the foam along the boundary of the combustion gases and thus into the jet boundary of the exhaust gases. The foam may be injected at any point along the gas boundary zone including the boundary layer upstream of the exhaust exit.

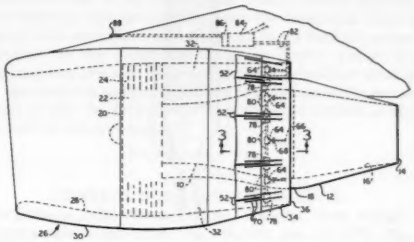
3,815,357

THRUST REVERSING APPARATUS

John M. Brennan, Chula Vista, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jan. 28, 1971, Ser. No. 110,543
Int. Cl. F02k *3/02*; B64d *31/06*
U.S. Cl. 60—226 A **9 Claims**

Front fan jet engine has cowl surrounding engine and terminating in jet exhaust nozzle. Elongate streamlined shroud surrounds fan and engine to define annular duct for rearward flow of fan air. Reverser includes peripherally arranged outflow passage means extending through inner and outer walls of shroud forward of its trailing edge. Plurality of sets of control doors are peripherally arranged in the passage means. Each set includes a blocker door at inner wall of shroud pivoted aft to converge forward toward axis of engine, and combination of blocker doors forms frusto-cone when deployed to block rearward flow and divert it laterally to passage means. Each set also includes a deflector door at outer wall of shroud pivoted aft to deploy to forward diverging attitude, and doors combine to form frusto-cone diverging forward to guide diverted stream and introduce forward flow component for reverse thrust. Actuator means are located within shroud aft of the doors and include axially movable carriages. Push-pull links are connected between carriages and doors and lie flush on doors in stowed position. Aft movement of carriages pulls door through links to deployed position with links behind doors, so no part of actuating mechanism interferes with out-



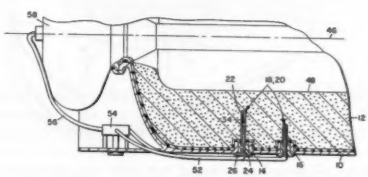
flow through passages. Controller coupled to air speed meter modulates movement of doors and prevents deployment above predetermined air speed and also increases deployment with reduction of air speed to prevent reingestion.

3,815,358

IMPULSE CONTROL SENSOR SYSTEM

Harry A. Younkin, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sept. 25, 1972, Ser. No. 292,228
Int. Cl. F02k *9/04*
U.S. Cl. 60—234 **7 Claims**



The invention is an impulse control sensor system for a solid propellant powered rocket motor, said system utilizing a sensing deflagrating fuse responsive to the burning front of solid propellant, a thrust control means and a transducer means communicatively connecting said fuse and said thrust control means.

3,815,359

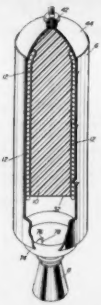
IGNITION SYSTEM FOR ROCKETS

James R. Thurston, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Feb. 23, 1966, Ser. No. 529,488
Int. Cl. F02k *9/04*
U.S. Cl. 60—254 **10 Claims**

A stack of igniters, individually responsive to electrical signals, is disposed either centrally or peripherally in the grain of an end-burning, solid-propellant rocket having capability of

combustion extinguishment in flight, for reignition at any stage of propellant consumption; both igniters and associated

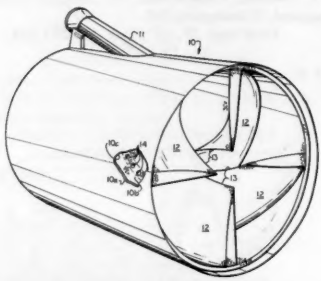


electrical wiring being protected from premature destruction by special thermal insulation.

3,815,360
COMBINED INFRARED AND SOUND SUPPRESSOR FOR AIRCRAFT JET ENGINE

Jerry N. Wellinitz, La Mesa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Apr. 16, 1971, Ser. No. 134,678
Int. Cl. F02k *1/26*
U.S. Cl. 60—264 **8 Claims**



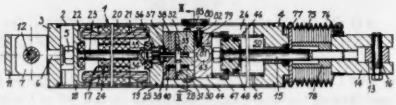
For reducing line-of-sight, infrared radiation and exhaust noise from the tailpipe of a jet aircraft engine, a plurality of hollow helical vanes with porous walls and supplied internally with pressurized coolant fluid are mounted co-axially and in symmetrically distributed arrangement, within a hollow tailpipe, the inner wall of which is also porous. Each vane has circumferential extent within the tailpipe sufficient to completely mask line-of-sight exposure into the engine from any point aft of the plane of the exit end of the tailpipe and to provide acoustic baffling and swirl for external mixing. Where the engine has an axial tail cone or bullet, the inner edges of the vanes may define a hollow axial core equal in diameter to the bullet.

3,815,361
DEVICE FOR OPERATING HINGED CLOSURES

Giuseppe Manini, Via Malavasi 26, Casalecchio di Reno, Italy (40033)

Filed Mar. 16, 1972, Ser. No. 235,129
Int. Cl. F15b *15/18*
U.S. Cl. 60—477 **3 Claims**

A device for opening and closing hinged closure including a hydraulic pump driven by an electromotor and feeding a cylinder of a double-action hydraulic jack through valve elements, comprising a tubular container closed by respective caps and accomodating the electromotor and jack in such a manner that the axes thereof are in line with each other and that the shaft of the jack extends axially from said container, the pump being located between the electromotor and the jack, and the container forming with the pump and the jack a water-tight well in respect to the electromotor and serving as tank for the oil, the valve elements including a body, a cylindrical cavity machined in the body which is connected to the

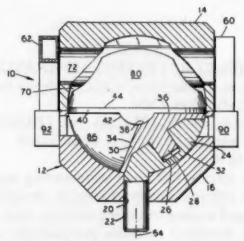


forward-action and return-action pipes of the pump and to the opposing chambers of the double-acting jack, a valve of non-return located at one end of the cavity and designed to permit the passage of the forward-action oil toward the cylinder, a small piston guided in the cavity between the inflow openings of the pipes into the cavity and designed to open the non-return valve for the return of the oil from the cylinder to the pump, the forward action and return-action pipes being connected each with the well through adjustable flow-control valves and check valves.

3,815,362
ROTARY ENGINE

Herman Joseph Kolbinger, 690 S. Main St., New City, N.Y. 10956

Continuation-in-part of Ser. No. 45,063, June 10, 1970. This application Jan. 11, 1973, Ser. No. 322,635
Int. Cl. F02g *1/04*
U.S. Cl. 60—525 **13 Claims**



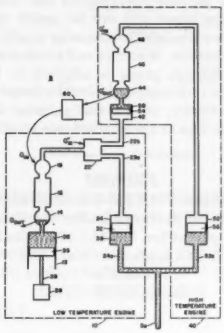
There is disclosed a rotary engine providing two cooperating Stirling cycle systems, the engine including a spherical cavity divided by a pivotal disk into two hemispherical sections one of which is divided into two chambers and is in heat exchange relationship with a heat source, a conduit connects each of the two hot chambers to the cold section. A spherical wedge is rotatably mounted in the cold section and is drivingly connected to a crank shaft. Expanding fluids alternating in the hot sections cause the disk to pivot and the wedge to rotate and pivot effecting rotation of the crank shaft.

3,815,363

MULTIPLE CYCLE TIDAL REGENERATOR ENGINE

Fred N. Huffman, Sudbury, and Kenneth G. Hagen, Acton, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 15, 1973, Ser. No. 323,889
Int. Cl. F03g 7/06
U.S. Cl. 60—531 14 Claims



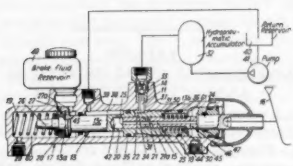
A tidal regenerator heat engine using separate condensable vapors as working fluids in each of two or more interconnected single cycle tidal regenerator heat engines. Cyclic condensation and evaporation of the working fluids takes place in a controlled manner in the respective ones of variable liquid level regenerators in the single cycle component engines. A first working fluid having a relatively low vapor pressure is successively heated, vaporized at constant pressure, and condensed in part at constant volume and in part at constant pressure. The heat extracted during condensation provides input heat to a second working fluid having a relatively high vapor pressure which is successively heated, vaporized at constant pressure, superheated, cooled at constant volume, condensed in part at constant volume and in part at constant pressure. The heat required for the second low temperature working fluid cycle is provided from the heat rejected by the first high temperature working fluid cycle.

3,815,364

MASTER CYLINDER FOR A TWO-CIRCUIT BRAKE SYSTEM

Juan Belart, and Werner Volkmar, both of Walsdorf, Germany, assignors to ITT Industries, New York, N.Y.

Filed Nov. 20, 1972, Ser. No. 307,909
Claims priority, application Germany, Dec. 24, 1971, 2164592
Int. Cl. F15b 7/08, 9/10
U.S. Cl. 60—552 20 Claims



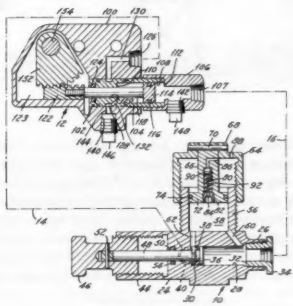
This relates to a master cylinder for a two-circuit brake system having a hydropneumatic accumulator connected thereto. The master cylinder includes a master piston having coaxially disposed therein an axially displaceable control piston. A spring controls the relative motion of the master piston and control piston. The control piston includes a longitudinal bore and a transverse bore in communication. The transverse bore will line up with the accumulator valve and apply pressure from the accumulator through the longitudinal bore to the working surface of the master piston. Upon actuation of the brake pedal, at first a certain pressure is applied to at least one of the two brake circuits by the master piston. Further advance of the brake pedal causes relative displacement between the two pistons until the transverse bore is aligned with the valve which is opened by an inclined surface contained in the outer surface of the master piston. Immediately the pressure delivered by the accumulator through the open valve is applied to the working surface of the master piston so that the brake force to both brake circuits is now provided by the accumulator.

3,815,365

CONTROL FOR REARVIEW MIRROR

John I. House, 27201 Wellington Dr., Franklin, Mich. 48025

Continuation-in-part of Ser. No. 106,688, Jan. 15, 1971, Pat. No. 3,702,535. This application Oct. 19, 1972, Ser. No. 299,029
Int. Cl. F15b 7/00
U.S. Cl. 60—572 1 Claim



A remote control actuating mechanism for adjusting the angular position of an outside vehicle rearview mirror. The mechanism comprises a master control device and a slave device, each having a piston reciprocable within a cylinder. Hydraulic circuits connect the two devices so that when the control piston is manually moved in one direction or the other there is a corresponding movement of the slave piston. A rack and gear connection between the slave piston and the mirror causes the mirror to be angularly adjusted in response to movement of the slave piston. A reservoir associated with the master cylinder communicates with both hydraulic circuits and has a control plunger for adjusting the pressure of fluid therein.

3,815,366

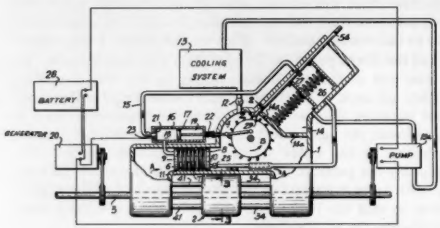
APPARATUS FOR DELIVERING POWER

Wilmer Keyes, 746 McDonough St., Brooklyn, N.Y. 11233

Continuation-in-part of Ser. No. 29,426, Nov. 24, 1970, Pat. No. 3,716,216, which is a continuation-in-part of Ser. No. 802,331, Feb. 24, 1969, abandoned. This application Sept. 28, 1972, Ser. No. 293,165
Int. Cl. F01k 27/00
U.S. Cl. 60—698 10 Claims

A power delivery device comprises a reciprocably driven piston plate which in a power stroke forces liquid in a closed circuit through an output coupling to drive an output shaft. A pneumatic circuit includes a reciprocating piston which is ex-

ternally driven and which serves to impart reciprocation to the piston plate. The reciprocating piston is connected to a rotata-



ble blade wheel in the liquid circuit to absorb energy from the liquid circuit and minimize the external power supplied to the device.

3,815,367

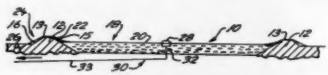
FLOATING RESERVOIR COVER

James Benson Collins, 2795 W. 50th Ave., Vancouver, British Columbia, and Frank William Farrow, 874 Underhill Dr., Delta, British Columbia, both of Canada

Filed Mar. 23, 1973, Ser. No. 344,233

Int. Cl. E02b , B65g *5/00*

U.S. Cl. 61—1 **16 Claims**



Floating cover assembly having diaphragm which lies directly on surface of body of liquid. Edges of diaphragm extend beyond edge of liquid and have stiffening members which are resiliently secured by anchoring lines to ground anchors. Resilient anchoring lines or freely hanging weights hold diaphragm in place relative to liquid, and permit diaphragm to move in response to change in liquid level. Thus diaphragm is always supported by liquid, and tension in diaphragm is low.

3,815,368

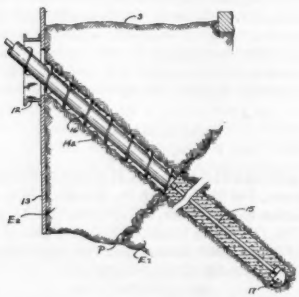
METHOD FOR INSTALLING CONCRETE ANCHOR PILES IN SITU

Lee A. Turzillo, 2078 Glengary Rd., Akron, Ohio 44313

Filed July 19, 1973, Ser. No. 380,917

Int. Cl. E02d *5/34*

U.S. Cl. 61—35 **7 Claims**



Method for placing anchor pile, as for bracing an earth retaining wall, includes an anchor rod axially centered in a bore augered in an earth situs at a location including an overburden of loose earth held against movement along an inclined slippage plane by a retaining wall. An auger drill is progressively withdrawn from the bore while fluid hydraulic cement mortar is pumped through auger shaft to form a pile in the bore, to requisite extents above and below slippage plane, with a tie-back rod axially centered therein. While mortar in the bore is in partially set, but still somewhat soft condition, a hollow shafted auger is operated to drill a new hole in the formed pile, along central axis thereof, to adjacent slippage plane. Upon substantial hardening of the remainder of the formed pile, the portion of centered rod extending freely above the slippage plane will not be under any substantial degree of radial tension, which otherwise would have been applied by the overburden. A part of rod located in hole extending above the slippage plane is adapted to be selectively detached from the retained portion of the formed pile at point in the redrilled cavity, as for the purpose of subsequent removal of overburden to a selective lower level.

3,815,369

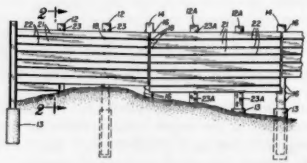
SHORING SYSTEM COMPONENTS

John A. Meredith, 945 S. Huron St., Denver, Colo. 80223

Continuation-in-part of Ser. No. 155,928, June 23, 1971, Pat. No. 3,728,862. This application Mar. 19, 1973, Ser. No. 342,570

Int. Cl. E02d *17/04*

U.S. Cl. 61—39 **10 Claims**



A shoring system for building site excavating operations utilizing caisson holes drilled in spaced positions outside the building perimeter and receiving flanged pile elements with paired main piles disposed at regulated elevations and spacing and having vertically spaced support sockets adapted to receive fastener components for the support of horizontally disposed sheeting pieces that are placed progressively in inverted order to hold back loose materials as the foundation excavation is deepened. Intermediate pile elements are disposed between the main pile elements in aligned positions with respect thereto, and the flanges of such intermediate pile elements provide vertically elongated adjustment slots for the reception of a flange clamp receptacle that is adjustably positioned along the slot and held in such position by a spring clip. With such arrangement threaded or other fasteners to be received and held by the receptacles are extended through the slots provided by the main pile fastener components to hold the sheeting securely against the intermediate piles thereby providing additional shoring support. The flange clamp receptacles are in general disposed behind the flange of intermediate piles, and a shoulder or stop extends into such elongated slots to prevent rotary dislocations of the flange clamp receptacle.

3,815,370

METHOD OF FORMING SPIRAL OR HELICAL TUNNELS AND SECTIONS THEREFOR

Richard B. Lennox, Winnipeg, Manitoba, Canada, assignor to Spiroll Corporation Ltd., Winnipeg, Manitoba, Canada

Filed June 29, 1972, Ser. No. 267,576

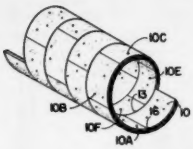
Claims priority, application Great Britain, July 3, 1971, 32104/71

Int. Cl. E21d *11/08;* **E04b** *1/32*

U.S. Cl. 61—45 R **12 Claims**

A spiral tunnel liner is formed by precasting sections of the tunnel liner in concrete and then bolting them together to

form the spiral or helix. Sealing and grouting channels are provided along the edges of each section which receives sealant



and grout after assembly thus giving a completely sealed and smooth bored tunnel which can be constructed readily and easily behind the tunnel mole.

3,815,371

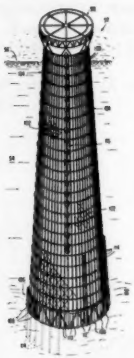
OFFSHORE TOWER APPARATUS AND METHOD

Albert M. Koehler, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 30,098, April 20, 1970, Pat. No. 3,668,876. This application Mar. 27, 1972, Ser. No. 238,167

Int. Cl. E02d *7/00, 5/74*

U.S. Cl. 61—46.5 **5 Claims**



A tower suitable for use in offshore well operations and the like including a plurality of sloping jacket legs extending from the bed of the body of water to a position above the surface of the body of water for supporting a platform thereupon. The jacket legs are reinforced by a surrounding shell of diamond patterned cross braces and a plurality of girder rings lying in a plurality of planes normally with the central axis of the tower. The girder rings are supported against deformity by a bicycle spoke reinforcing system at each girder ring level.

The method aspects of the invention include constructing the tower in a generally horizontal posture upon a plurality of generally upright columns. The construction steps include forming a plurality of girder rings and erecting the girder rings upon the columns. Jacket legs are connected between adjacent girder rings along the length of the offshore tower and the tower legs are enclosed within an outer shell of cross bracings. The offshore tower, following construction, is launched into a body of water for transportation to a selected marine site by constructing the tower longitudinally upon a rail having one end thereof lying adjacent a sheet pile wall which permits the lower end of the rail to be positioned below the adjacent water level. A floatation system connected to the tower and the wall is removed to permit the base of the tower to be buoyantly lifted from the construction support. The upper portion of the tower rests upon a rail bearing guide bracket which is initially positioned above the water level. The rail bearing guide bracket may be lifted off the rail by an incompressible fluid and the tower slides into the body of water. Alternatively, the tower may be jacked into the water by conventional jacking devices. Upon being erected at an offshore location, conductors may serve in a dual capacity as conductors and piles, or piles may be inserted into skirt pile casings surrounding the base of the tower and driven into the bed of the body of water by a stinger guided by a rotating truss.

3,815,372

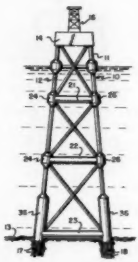
MARINE STRUCTURE

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed May 18, 1972, Ser. No. 254,777

Int. Cl. E02b *17/00*

U.S. Cl. 61—46.5 **5 Claims**



The invention relates to a marine structure or foundation of a type that rests on, and is firmly fixed to the floor of an offshore body of water. The structure comprises a plurality of substantially vertically disposed legs which are laterally connected by a series of cross members to form an open unit. At least a segment of the respective legs and cross members are controllably buoyant whereby the structure can be floated to a submerging site. The legs and cross members are further interconnected at an enlarged joint adapter which serves to guide piles along the respective legs as the piles are being driven.

3,815,373

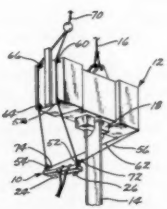
PILING CLAMP

Davis W. Giroux, 3 Lakewood, Council Bluffs, Iowa 51501

Filed June 7, 1972, Ser. No. 260,419

Int. Cl. E02d *7/00*

U.S. Cl. 61—53.5 **10 Claims**



A piling clamp means is disclosed herein which is adapted to be used in combination with a piling pulling apparatus such as a vibrating hammer suspended from the hoist line of a crane. The clamp means comprises a pair of hydraulically operated jaw members which may be moved into gripping engagement

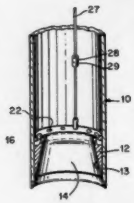
with the piling being pulled. The clamp means is suspended from a cable means connected to the vibrating hammer and the crane whip line to enable the clamp means to be moved from a position remote of the piling being pulled to a position adjacent the piling being pulled so that the jaw members may grip the same.

3,815,374

METHOD AND APPARATUS FOR INSERTING CYLINDRICAL PILING

Michael G. Hogan, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed July 19, 1972, Ser. No. 273,070
Int. Cl. E02d 7/24
U.S. Cl. 61—53.74 **7 Claims**



The invention relates to a method and apparatus for effectively driving cylindrical piling into a substratum or soil having a consistency that would otherwise tend to plug the pile. The method consists of driving the pile, and constricting the compacted earthen plug at the lower end thereof. High pressure streams of fluid are then introduced at the pile lower end in a direction to erode, and break up the plug to prevent the latter from adhering to the pile walls. The disturbed fluidic mass at the pile lower end can then be removed or at least be rendered into a condition where it will not plug the pile.

The apparatus comprises a cylindrical, metallic walled pipe. The lower end of the latter includes an annular shoe depending therefrom and having a constricted passage therein defined by a gradually tapering profile. A manifold formed in the shoe receives a high pressured fluid such as water, and directs the same through a plurality of orifices toward both the pile wall, and the confined plug.

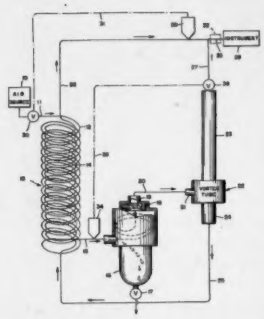
3,815,375

PRESSURE REGULATING REFRIGERATIVE AIR DRYER SYSTEM

Leslie R. Inglis, Cincinnati, Ohio, assignor to Vortec Corporation, Cincinnati, Ohio

Filed July 6, 1973, Ser. No. 376,936
Int. Cl. F25b 9/02
U.S. Cl. 62—5 **11 Claims**

A highly efficient and relatively simple refrigerative dryer system for removing moisture from pressurized air while simultaneously reducing the pressure of that air to a regulated level suitable for operating various instruments, such as control instruments used in heating and air conditioning equipment or other instruments incorporating fluidic elements. The system includes a vortex tube which utilizes the difference in line pressure and instrument (discharge) air pressure to cool the inlet air and, in conjunction with a conventional separator, to remove moisture from the cooled air before it enters the vortex tube. Air pressure downstream of the vortex tube is monitored and, if it exceeds a predetermined level, the flow of inlet air is interrupted by suitable valve means coacting with the pressure sensing device until the downstream pressure again drops below the predetermined level. In one embodiment, the system also includes a thermal sensor, operating in combination with a control valve near the vortex tube's hot



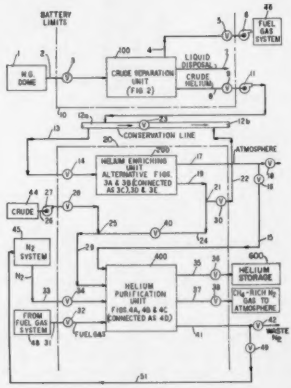
end, for insuring that the temperature of cooled air entering the separator will not drop below a minimum preselected level.

3,815,376

PROCESS AND SYSTEM FOR THE PRODUCTION AND PURIFICATION OF HELIUM

Antony Lofredo, Springfield, and Alfred J. Surowiec, Maplewood, both of N.J., assignors to Airco, Inc., New York, N.Y.

Filed July 31, 1969, Ser. No. 846,490
Int. Cl. F25j 3/00, 3/06, 5/00
U.S. Cl. 62—22 **44 Claims**



An overall process comprising a series of three successive operations for deriving helium from natural gas and purifying it to 99.9969 mol percent, minimum. In the initial operation, the natural gas feed, containing 15 to 40 mol percent of helium, is cooled and flashed in two stages. Both the crude helium product and the vaporized condensate from the flash stages serve to refrigerate the feed stream. The condensate by-product provides commercial grade fuel gas. In the intermediate operation, an input stream having a helium content from 60 to 80 mol percent is enriched to a purity of 85 to 97 mol percent by cooling it to below liquid nitrogen temperature, and passing it through a helium separator. The effluent helium-rich vapor is optionally reheated, then work expanded, and used as a refrigerant for the feed stream. Dissolved helium

is removed from the condensate in the helium separator by auxiliary flashing, and returned to the recycle stream, the condensate from the latter stage ultimately serving as a refrigerant. In the final operation, the enriched helium undergoes purification by catalytic action to remove hydrogen. It is then dried, compressed, cooled, passed through several stages of flashing and additional cooling, and through carbon adsorbers to remove the balance of nitrogen. The cold, nearly pure product is finally heat exchanged with a feed stream prior to storage. Condensate from the flashing stages, and liquid from an auxiliary nitrogen system provide refrigeration for the final purification operation.

3,815,377

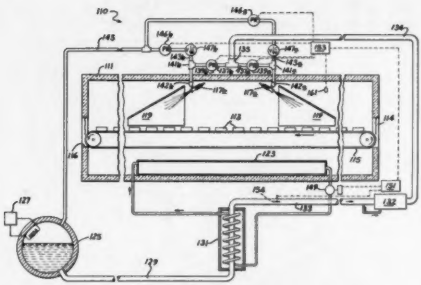
SYSTEM FOR COOLING MATERIAL USING CO_2 SNOW

Lewis Tyree, Jr., 10401 S. Oakley Ave., Chicago, Ill. 60643

Continuation-in-part of Ser. No. 14,575, Feb. 26, 1970, Pat. No. 3,672,181. This application Jan. 27, 1972, Ser. No. 221,212

Int. Cl. F25d *25/03*

U.S. Cl. 62—62 **16 Claims**



High pressure liquid CO_2 is expanded through nozzles to produce CO_2 snow which is applied to the material being cooled. CO_2 vapor is suitably connected, as through a check valve, to a location between the snow nozzle and a control valve therefor. Vapor pressure is regulated so that CO_2 vapor will be immediately supplied to flush liquid CO_2 from the conduit leading to the snow nozzle whenever snow-making is halted. When an insulated cooling enclosure is used, as in a food freezer, a continuous flow of CO_2 vapor is maintained through the nozzles sufficient to prevent the entry of ambient air into the enclosure when snow-making is temporarily halted.

3,815,378

REFRIGERATION FAN CONTROL SYSTEM

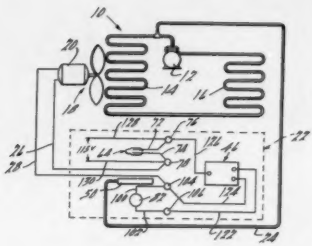
Walter Harold Hoenisch, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 349,023, April 9, 1973. This application May 11, 1973, Ser. No. 359,607

Int. Cl. F25b *39/04*

U.S. Cl. 62—184 **18 Claims**

A control for a refrigeration system including a compressor, a condensor, an evaporator and an electrically energized fan for passing air in heat exchange relation with respect to the compressor, the control including a light source, fan control means responsive to the light source for varying the operating speed of the fan, and means for varying the magnitude of light



transmitted to the fan control means from the light source in response to the refrigerant pressure in the refrigeration system.

3,815,379

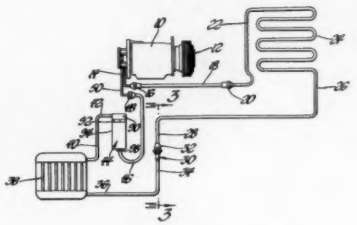
UNIFIED ORIFICE FILTER/MUFFLER EXPANSION CONTROLLER

Carl A. Scherer, Clarence Center, and Hugh J. Muirhead, Ransomville, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1972, Ser. No. 302,108

Int. Cl. F25d *19/00*

U.S. Cl. 62—296 **3 Claims**



A refrigerant expansion means for an automobile air conditioning system of the type employing a small diameter tube to pass refrigerant from the condenser to the evaporator. An unpleasant and sometimes alarming hissing noise which is characteristically emitted by this type of expansion means when the compressor is de-activated is muffled by a cup-shaped member around the outlet of the tube. This member may be of porous sintered metal material which readily passes refrigerant therethrough but blocks much of the noise emitted at the tube's outlet and prevents it from passing to the occupant of the automobile.

3,815,380

SHAFT COUPLING APPARATUS

Edward N. Esmay, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

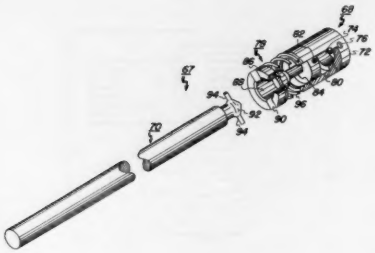
Filed Dec. 4, 1972, Ser. No. 312,239

Int. Cl. F16c *1/26*

U.S. Cl. 64—4 **4 Claims**

An apparatus in which a pair of shaft members are readily

decoupled and coupled to one another for rotary movement in unison.



The foregoing abstract is not intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,815,381

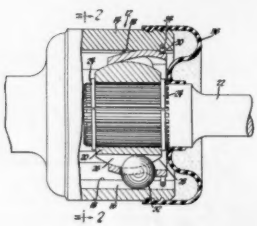
CONSTANT VELOCITY UNIVERSAL JOINT GAGE

Elmer R. Wagner, Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 12, 1972, Ser. No. 270,983

Int. Cl. F16d *3/30*

U.S. Cl. 64—21 **10 Claims**



Four embodiments of a cage having offset inner and outer partispherical control surfaces for locating the drive balls of a universal joint in the constant velocity plane are disclosed. Each of the four cages is designed to be manufactured by die forming a cylinder of uniform wall thickness — two cages being heavy wall construction and two cages being thin wall construction. In each of the four cages the offset inner and outer partispherical control surfaces are circumferentially located so that they overlap in an interposed relationship to minimize the length of the cage.

3,815,382

ARRANGEMENT FOR MOUNTING SINKERS IN A CIRCULAR KNITTING MACHINE

Pavel Uhlir, Trebic, Czechoslovakia, assignor to ELITEX, Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

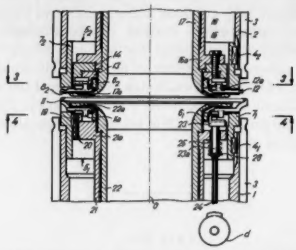
Filed Nov. 23, 1971, Ser. No. 201,283

Claims priority, application Czechoslovakia, Nov. 30, 1970, 8043-70

Int. Cl. D04b *15/06*

U.S. Cl. 66—14 **7 Claims**

A sinker arrangement comprising an annular support ring located within the cylinder, having means for holding the sinkers in radially spaced relationship and means for sliding the



sinkers in a horizontal plane perpendicular to the axis of cylinder rotation.

3,815,383

CONTROL MECHANISM FOR CIRCULAR KNITTING MACHINE WITH ROTATING NEEDLE CARRIER

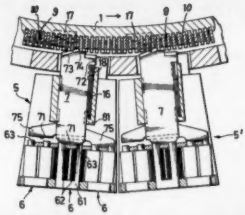
Gerhard Hamma, Spaichingen Wurttemberg, Germany, assignor to Maschinenfabrik Spaichingen GmbH Spaichingen/Wurttemberg, Germany

Filed Apr. 7, 1972, Ser. No. 242,179

Claims priority, application Germany, Apr. 10, 1971, 2117713

Int. Cl. D04b *15/78, 15/14*

U.S. Cl. 66—50 R **8 Claims**

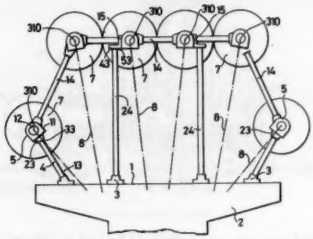


A pattern control mechanism for a circular knitting machine with a rotating needle carrying cylinder, in which the needles are controlled at a pattern position by means of a plurality of electromagnetically controlled pattern devices, each needle being provided with an associated needle jack having control feet which follow each other in sequence in a stepwise manner, the needle jacks being slidable in the needle cylinder and being selectively swingable; at the pattern selection point all of the needle jacks with their control feet are carried past a ramp-like cam which swings the needle jacks into a first position, in which they cooperate with their jack-advancing cam. A plurality of radially inwardly yieldably biased slide members are provided for swinging the respective jacks into a second position wherein they do not cooperate with such cam. Every slide means is provided with a magnetic holding mechanism which retains the respective slide means in an outer, retracted position, the returning force which opposes the magnets being less than the holding strength of the magnets. The respective slide members are retracted by magnet slide retracting feet mounted on the cylinder so as to retract the magnet armature into proximity with the pole piece of the magnet. If the magnet is then energized by a pattern control mechanism, the slide members remains retracted and thus the respective needle jack remains swung outwardly in operative position. If the magnet is not energized, the needle jack is swung inwardly into inoperative position by the slide members.

3,815,384
COUPLING FRAME FOR THE PIPE FRAME FOR WARP BEAM BEARINGS

Karl Kohl, 10 Chlorodont Strasse, Obertshausen, Germany (6053)

Filed Sept. 22, 1972, Ser. No. 291,493
Int. Cl. D04b 27/16
U.S. Cl. 66—86 A 3 Claims

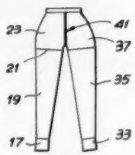


The invention concerns a coupling sleeve for a sturdy support structure constructed of tubes for an adjustable frame for the bearings of the Warp beams of a Warp knitting machine.

3,815,385
SEAMLESS TUBULAR GARMENT

Franco Gariboldi, Condove, Italy, assignor to G. Billi & C. S.p.A., Firenze, Italy

Filed July 12, 1971, Ser. No. 161,622
Int. Cl. D04b 9/42
U.S. Cl. 66—172 R 1 Claim



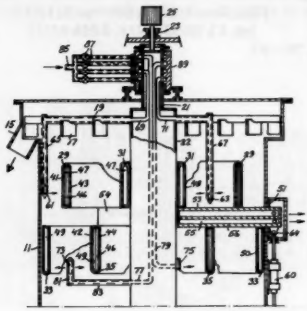
This invention relates to a method of knitting on a circular knitting machine and to the resulting tubular article having successive portions along its length with varying numbers of wales according to a pre-selected pattern. The wales are preferably spaced uniformly about the circumference of the tubular article. In the illustrated embodiment, a one-piece panty-hose having sections joined at a juncture during knitting and is formed with more wales in the pant portion than in the adjoining leg portions.

3,815,386
DEVICE FOR BLEACHING OF CELLULOSIC PULP

Johan E. Gullichsen, Helsingfors, Finland, and Rolf G. Ekholm, Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Filed Jan. 31, 1972, Ser. No. 222,230
Claims priority, application Sweden, Feb. 2, 1971, 1246/71
Int. Cl. D21d 5/02
U.S. Cl. 68—181 R 4 Claims

For the bleaching of cellulosic pulp the pulp is fed continuously through a standing cylindrical vessel provided with concentric strainer bodies for withdrawal of liquid from the pulp and with nozzles moved in circular paths between the strainer bodies for supply of bleaching liquid. Bleaching liquid passes from said nozzles horizontally through the vertically moving pulp column towards the strainer bodies where liquid is withdrawn from the pulp. In order to equalize the action and

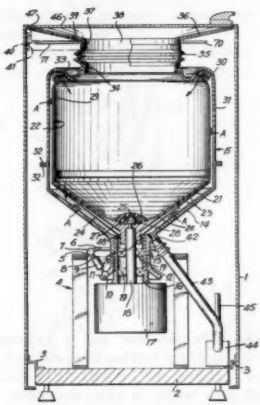


the bleaching chemicals upon the pulp, at one level of the vessel bleaching liquid is forced through the pulp in one radial direction and at another level bleaching liquid is forced through the pulp column in the opposite radial direction.

3,815,387
CLEANING MACHINE

Felice F. Murgo, Albany, N.Y., assignor to M.B.K. Internationale Ltd., Albany, N.Y.

Filed Apr. 3, 1972, Ser. No. 240,358
Int. Cl. D06f 23/04, 37/24
U.S. Cl. 68—23.3 2 Claims



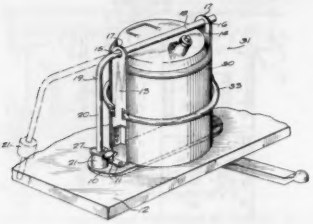
A cleaning machine according to which work, such as articles of clothing, is cleaned with a suitable cleaning liquid which may be either a washing liquid or a dry-cleaning solvent. This liquid is continuously circulated along a closed path in one direction through the interior of a container for the work and in an opposite direction at the exterior of the container so that the work is cleaned by a liquid which moves at all times in only one direction with respect to the work. The structure of the container is such that it acts as a centrifugal pump for generating a centrifugal force to circulate the cleaning liquid. Part of this liquid can be circulated along a second path before returning to a tank for the liquid, and along this second path this recirculated part of the liquid is subjected to a treatment which improves the cleaning action of the cleaning liquid.

3,815,388

FLAMMABLE FLUID CONTAINER SECURITY DEVICE

Thomas W. Nichol, 3817 N. 52nd St., Milwaukee, Wis. 53216, and Richard J. Schmidt, 4068 N. 91st St., Milwaukee, Wis. 53222

Filed Dec. 4, 1972, Ser. No. 311,752
Int. Cl. B65d *55/14*; E05b *65/52*
U.S. Cl. 70—63 2 Claims



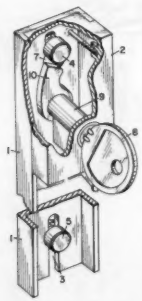
A base, frame and lock assembly for securing a container of flammable liquid such as gasoline on a trailer for snowmobiles or the like. A padlock secures a cover, which when lifted by removal of the padlock permits access to threaded means for release of a detent which normally prevents removal of the fuel container.

3,815,389

SELF-LOCKING SECURITY BAR

Fred F. Richards, Sr., 6837 Chevy Chase, Dallas, Tex. 75225

Filed Mar. 23, 1973, Ser. No. 344,138
Int. Cl. E05b *65/06*, *65/46*
U.S. Cl. 70—78 5 Claims



A combined Security Bar and a key-operated locking mechanism designed for locking filing cabinets, chests, doors, drawers, and furniture and for locking typewriters and other items to desk tops, tables, or other structures. A bar having a shaped opening or slot in one end and a key hole in the other end over which is attached a lock mechanism which includes a key-operated cylinder and a cam rotatable with the lock cylinder to cover enough of the key hole to prevent entry into or removal from said keyhole a notched-pin when the key-operated cylinder is in a locked position.

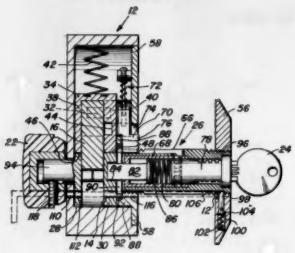
3,815,390

LOCK

Harry J. Stoia, c/o Boston Lock & Safe Co., Inc., 906 Beacon St., Newton, Mass. 02215

Filed Oct. 30, 1972, Ser. No. 302,254
Int. Cl. E05b *63/00*, *9/06*
U.S. Cl. 70—134 14 Claims

The deadbolt of a lock mechanism is operable from either side of the door by means of a pair of independently operable cams controlled, respectively, on the inside by a knob and on the outside of the door by a key-cylinder arrangement. The lock may also be operable and controlled from the inside by a key-cylinder arrangement. Each of the cams is arranged to release a detent mechanism which normally restrains the



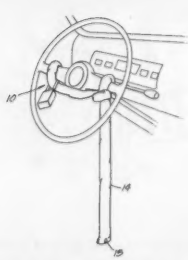
deadbolt from movement from either of its effective length of the key-cylinder which is unique and adjustable to accomodate a range of door thicknesses. The lock also includes an arrangement by which the outside cover plate cannot be tampered with to gain forceful entry.

3,815,391

AUTOMOBILE ANTI-THEFT DEVICE

Lee M. Latta, 1922 Rodeo Rd., Los Angeles, Calif. 90018

Filed Apr. 23, 1973, Ser. No. 353,381
Int. Cl. B60r *25/02*
U.S. Cl. 70—209 8 Claims



A metal tube has a length of chain secured within and a portion extending outwardly. The metal tube is initially located adjacent the steering wheel and allowed to hang downwardly. The chain is knotted about a radially extending crossbar of the steering wheel with the remaining portion of the chain being wrapped about another crossbar and locked in place. On attempting to turn the steering wheel with the anti-theft device in place, the metal tube will obstruct against the seat, dashboard, gear shift lever, handbrake, or other part of the vehicle.

3,815,392

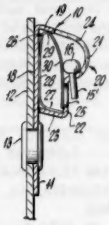
KEY RETAINER

Berek Laufer, 390 Ocean Pky., Brooklyn, N.Y. 11218

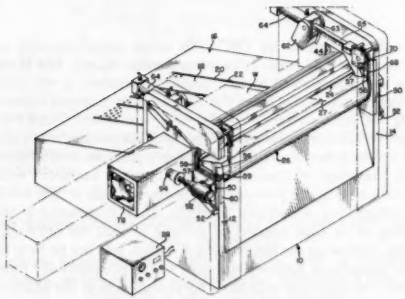
Filed July 21, 1972, Ser. No. 274,067
Int. Cl. A47g *29/10*
U.S. Cl. 70—456 B 2 Claims

A key retainer having a hollow support including a front wall with narrow slots each terminating in an enlarged opening. A U-shaped spring within the support with one leg spaced from the slots and lying against said enlarged openings. Key

retaining loops each having an enlarged end portion movable through said enlarged opening to depress the spring and engage a slit, the spring then removably retaining the loop in engagement with said slot.



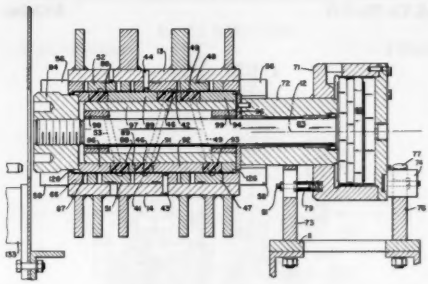
3,815,393
N.C. AUTOMATIC FOLDING MACHINE
Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., South Seattle, Wash.
Filed Oct. 4, 1971, Ser. No. 186,062
Int. Cl. B21d *41/02*
U.S. Cl. 72—7 **22 Claims**



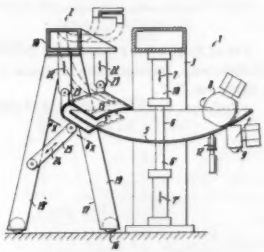
An N.C. automatic folding machine provides programmed positioning of the workpiece, multiple folding, and removal of the workpiece upon completion of the folds. Movement of the workpiece is assisted by a cushion of air. Apparatus and a method of automatically folding and handling sheet material from point of storage to point of ejection of the folded object. A folding die and punch assembly includes a folding die that clamps the workpiece against a supporting surface and a pivotally mounted folding punch that bends the workpiece around the folding die. The folding die is retracted laterally of the supporting surface to strip the workpiece from the die.

3,815,394
MACHINE AND METHOD FOR FORMING TUBULAR ADJUSTABLE ELBOWS
Edward Walker, Long Beach, Calif., assignor to Elbows Automatic Inc.
Filed Sept. 15, 1971, Ser. No. 180,633
Int. Cl. B21d *26/00, 39/08*
U.S. Cl. 72—55 **12 Claims**

A machine for forming tubular adjustable elbows has a frame on which are mounted split die shells opened and closed by a hydraulic jack and carrying split die rings having elliptical grooves. Axially within the die shells is an assembly of elastomeric elliptical rings opposite the grooves and interspersed with rigid spacers all movable together by a hydraulic squeezing jack effective to break an original integral tube into separate sections having beaded ends. Other hydraulic plungers telescope the sections together for further forming and interlocking by squeezing of the elastomeric rings to produce the final, sectional product. The method is carried out by starting with an integral circular-cylindrical tube, breaking the tube into separate sections along elliptical lines, enlarging or beading one end of some sections, telescoping the unbeaded ends into the beaded ends and then expanding the unbeaded telescoped ends into the surrounding beaded ends.



3,815,395
METHOD AND DEVICE FOR HEATING AND FLANGING CIRCULAR DISCS
Jochen Sass, Meckelfeld, Germany, assignor to Ottensener Eisenwerk GmbH
Filed Sept. 21, 1972, Ser. No. 290,851
Claims priority, application Germany, Sept. 29, 1971, 2148519
Int. Cl. B21k *29/00*
U.S. Cl. 72—69 **20 Claims**

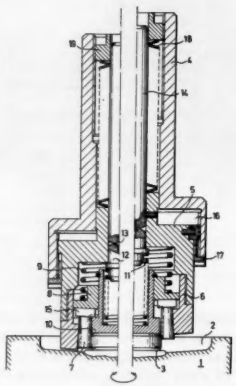


Circular discs used for boiler bottoms are flanged by being clamped, one at the time, in a flanging device and then are rotated about their central axis to be first heated along their circumferential marginal zone by a heat inductor supplied with alternating current. The heat inductor is U-shaped so as to embrace the circumferential edge of said circular disc to cover both sides of the same over a sector-shaped area. The heated marginal zone of said central disc during its rotation is shaped into the desired flange by flanging rolls, preferably mounted opposite the location where the heat inductor is caused to heat the circular disc.

3,815,396
APPARATUS FOR ROLLING CYLINDRICAL SURFACES ON A WORKPIECE

Bernhard Kunze, Erkelenz, Germany, assignor to Wilhelm Hegenscheidt Kommanditgesellschaft, Erkelenz, Germany

Filed Oct. 11, 1972, Ser. No. 296,535
Claims priority, application Germany, Oct. 13, 1971, 2150896
Int. Cl. B21d *22/14*
U.S. Cl. 72—121 **6 Claims**

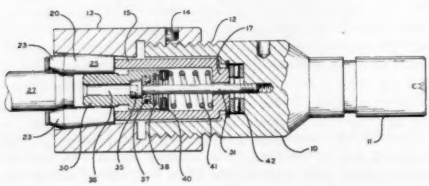


A hollow rotatable drive shaft has an annulus of elongated workpiece-engaging rollers which are rotatable about the axis of the shaft and which are each inclined to this axis, the surface to be rolled being adapted to be located within the annulus. A roller cone surrounds and guides the rollers and an arrangement for advancing the rollers and cone axially forwardly is provided. Abutments engage the rollers when the same have performed a predetermined axial movement to prevent further such movement while permitting continued axially forward movement of the cone. In response to such forward axial movement of the cone a spring arrangement located in the shaft exerts via the cone a force upon the rollers which counters a rearwardly directed axial force emanating from the rollers.

3,815,397
SWAGING AND FINISHING TOOL

Eugene A. Hollencamp, Dayton, Ohio, assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,087
Int. Cl. B21d *41/04*
U.S. Cl. 72—121 **5 Claims**

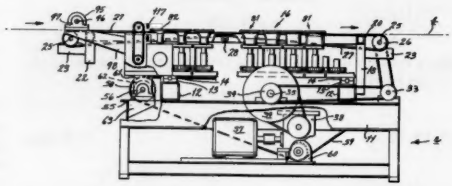


The tool of this invention functions to effect a substantial reduction in the end portion of the workpiece. A circular series of rollers, mounted in a roller cage, are contained within a mandrel sleeve fixedly secured to a driver. The forward end portions of the rollers are formed with conical surfaces converging toward the outer ends of the rollers. A roller supporting plug is rotatably attached to the driver and is positioned within the inner portions of the rollers for engagement thereby to maintain the rollers against the inner surface of the mandrel. The rollers and the inner surface of the mandrel are dimensioned so that the portions of the rollers intermediate the forward and inner ends thereof inscribe a diameter inside the intermediate portions of the rollers of proper size to form the diameter of the reduced end portion of the workpiece and finish the same.

3,815,398
ROLL MACHINE FOR ALTERNATE CLEAT FORMING

Lamont R. McClain, Mehlville, Mo., assignor to Engel Industries, Inc., Ballwin, Md.

Filed Jan. 19, 1973, Ser. No. 325,039
Int. Cl. B21d *5/08*
U.S. Cl. 72—181 **12 Claims**

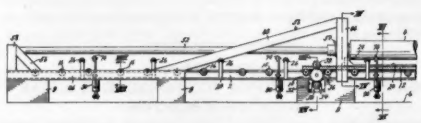


A roll machine forms 180° cleat bends simultaneously on both opposite side edges of conveyed metal blanks. The blank edges being demarked by intervening V-notches, it will bend alternate portions and leave the intermediate portions unbent. Along the lateral edges of a conveyor are symmetrically arranged roll former machines whose spindles project vertically. Rolls on the inboard spindles have upper surfaces immediately below the plane of conveyance; those on the outboard spindles have overlaying portions. The outboard rolls at first bending station are withdrawn laterally after commencing the bending of an edge portion of a blank so that the next edge portion, following the intervening V-notch, will not be bent by it. At subsequent forming stations, which progressively bend to 180°, the outboard rolls have horizontal slots at the plane of conveyance, to pass such unbent edge portions.

3,815,399
PIPE PERFORATING MACHINE

Noah E. Foulks, and Earl Lowry, both of Rt. No. 1, Dodge City, Kans. 67801

Filed Oct. 10, 1972, Ser. No. 295,838
Int. Cl. B21d *31/02*
U.S. Cl. 72—186 **5 Claims**



A pipe perforating machine consisting of a bed adapted to support a pipe for movement longitudinally of itself, powered mechanism for driving the pipe in both directions, and a plurality of cooperating pairs of perforating elements carried in spatially fixed relation by the bed and operable to perforate the pipe as it is moved in either direction. At least several

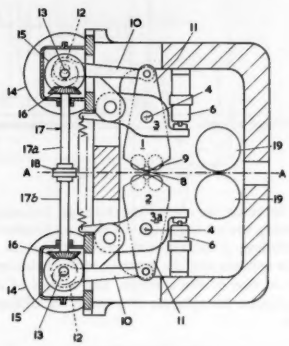
parallel rows of perforations may be cut on each pass of the pipe, and the pipe may be angularly indexed after each pass for cutting several additional rows of perforations during the next subsequent pass of the pipe in the opposite direction.

3,815,400

APPARATUS FOR REDUCING THE THICKNESS OF METAL

Karel Saxl, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, Witton, Birmingham, England

Filed Nov. 20, 1972, Ser. No. 307,825
Int. Cl. B21b *35/14*
U.S. Cl. 72—189 **4 Claims**



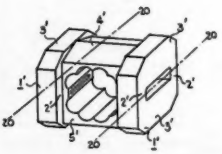
A pendulum mill for reducing the thickness of metal and in which driving means to the pendulum arms are interconnected to eliminate backlash in the system.

3,815,401

HOUSING CONSTRUCTION FOR CLUSTER TYPE COLD ROLLING MILLS

Tadeusz Sendzimir, and John W. Turley, both of Waterbury, Conn., assignors to T. Sendzimir Inc., Westbury, Conn.

Filed Feb. 5, 1973, Ser. No. 329,364
Int. Cl. B21b *13/14*
U.S. Cl. 72—242 **3 Claims**



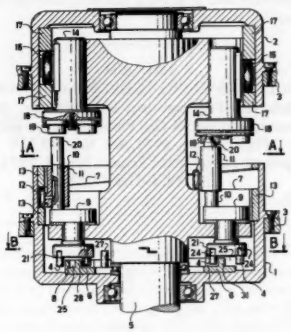
A housing for cold rolling mills of the cluster type. The housing comprises two heavy side frames, and upper and lower transverse slabs which serve to back the casters of the mill, and thus the intermediate roll and the workrolls. The transverse slabs are oppositely tapered from the middle, being thickest at the center and becoming thinner toward both the front and rear sides of the mill, whereby the combined effect of the side frame deflection and slab deflections measured at the workroll is substantially constant along the entire operating length of the workroll. The result is a housing wherein metal may be rolled with zero crown.

3,815,402

MULTIOPERATION MACHINE WITH CIRCULAR MOVEMENT

Ondrej Duran, and Rudolf Radic, both of Nove Mesto Nad Vahom, Czechoslovakia, assignors to Vyskumny ustav mechanizacie a automatizacie, Nove Mesto nad Vahom, Czechoslovakia

Filed Feb. 20, 1973, Ser. No. 333,810
Claims priority, application Czechoslovakia, Feb. 21, 1972, 1084-72
Int. Cl. B21j *11/00*
U.S. Cl. 72—404 **3 Claims**



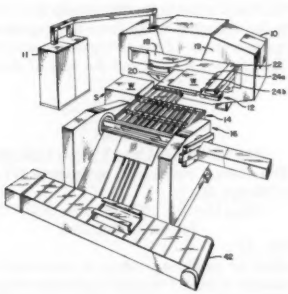
A multioperation machine, particularly a machine tool with circular movement enabling a number of operations to be performed with a workpiece clamped permanently on a clamping unit. The workpiece is adapted to be intermittently turned in the course of a partial circular movement of the machine so as to come in alignment with a particular tool capable to perform a required operation, and includes means bringing the workpiece in engagement with the respective tool.

3,815,403

PUNCHING-FABRICATING APPARATUS INTERFACE MECHANISM

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada Ltd., South Seattle, Wash.

Filed Dec. 4, 1972, Ser. No. 311,885
Int. Cl. B21d *43/28*
U.S. Cl. 72—405 **20 Claims**



A system of punching, transferring, shearing, stacking, and/or forming is employed. An interface transferring mechanism is integrally provided on the punching apparatus and has a secondary workpiece gripping clamp alignable with

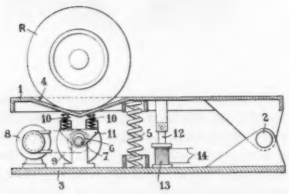
the primary workpiece gripping clamps of the punching apparatus. A pivotal arm supports the secondary workpiece gripping clamp and is operable to pivot the workpiece off the workpiece supporting table of the punching apparatus and onto a stacking mechanism, shearing table, forming apparatus or the like. When used with the shearing apparatus, the secondary workpiece gripping clamp can be fed toward the shearing blade by the workpiece positioning means of the punching apparatus. An automatic folding machine includes a transfer table suitable for moving the workpiece to an inclined workpiece supporting surface on the folding machine. The transfer table includes retractable frictional conveyor belts that control movement of the workpiece so that it may be raised to an inclined position and positively fed at a controlled rate onto the inclined supporting surface.

3,815,404

VEHICLE SUSPENSION CHECKING APPARATUS

Gerard Brisard, Fontenay-sous-Bois, France, assignor to Etablissements Muller & Cie, Paris, France, a part interest

Filed Oct. 20, 1972, Ser. No. 299,239
Claims priority, application France, Nov. 8, 1971, 71.39956
Int. Cl. G01m *17/04*
U.S. Cl. 73—11 **5 Claims**



Apparatus for checking the suspension systems of vehicles, which comprises a vibrating plate adapted to receive one wheel of the vehicle, as well as mechanical means adapted to impart to said plate vertical oscillations and detector means for controlling the wheel oscillations. Said vibrating plate is pivoted at one end about a horizontal hinged shaft and bears on the floor or a fixed base plate through at least one relatively stiff spring, means adapted to impart oscillations to said vibrating plate acting on said plate through the medium of one or a plurality of separate springs. The means for controlling said wheel oscillations consists of a device capable of detecting and measuring either the amplitude of the oscillatory movements of said plate or the value of its accelerations, or alternatively the variations in the force developing between said vibrating plate and one of the springs associated therewith, or between said vibrating plate and the tyre of the wheel being checked.

3,815,405

METHOD OF ANALYZING ODORS

Andrew Dravnieks, Chicago, Ill., assignor to IIT Research Institute, Chicago, Ill.

Filed Nov. 30, 1972, Ser. No. 310,773
Int. Cl. G01n *31/08*
U.S. Cl. 73—23 **7 Claims**

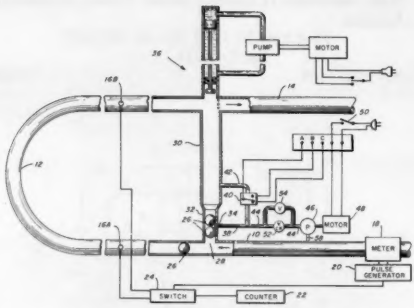
A method of analyzing odors is provided in which an odorant sample is passed through a plurality of gas chromatographic columns having stationary phases of differing chemical polarity. The numerical value of various subjective odor dimensions of the odorant sample which otherwise would involve subjective test panel analysis, may be determined from the retention times of the odorant sample with respect to the various stationary phase materials.

3,815,406

LEAK DETECTOR FOR DETECTING LEAKAGE IN A METER PROVER SYSTEM

Billy E. Davis, and Ronald G. Dunegan, both of Tulsa, Okla., assignors to Signet Controls Incorporated, Tulsa, Okla.

Filed Oct. 29, 1971, Ser. No. 193,924
Int. Cl. G01m *3/04*
U.S. Cl. 73—46 **5 Claims**



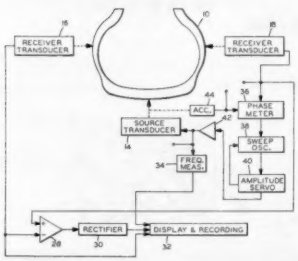
A leak detector for detecting leakage between adjacent spheres having sealed engagement with a cylinder in a meter prover including a differential pressure switch connected between the spheres and the interior of the cylinder to the opposite side of one of the spheres, and means of altering the pressure between the spheres to actuate the differential pressure switch.

3,815,407

RESONANCE TIRE INSPECTION METHOD AND APPARATUS

Adelbert L. Lavery, Natick, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Jan. 22, 1973, Ser. No. 325,392
Int. Cl. G01h *13/00*
U.S. Cl. 73—67.2 **11 Claims**



The non-destructive testing of tires to determine the presence of structural defects is accomplished by measuring imbalance in the transmission characteristics of a tire from the tread area to a pair of oppositely disposed points on the side walls as a test tire is rotated and contacted on the tread area by a vibrator which is caused to track a resonant frequency of the tire. Variations in resonant frequency as well as variations in transmission characteristics which do not unbalance the symmetry of the tire are also measured and the information collected permits identification of both the presence and nature of hidden defects.

3,815,408

AUTOMATIC AND CONTINUOUS ULTRASONIC FLAW DETECTING PROCESS

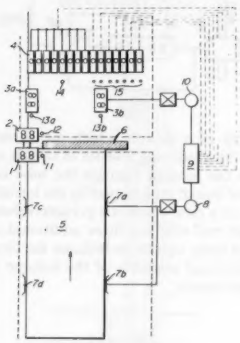
Yutaka Matsumura, Tokyo; Katsuyuki Nishifuji; Katsunori Watanabe, both of Yokohama, and Kenji Matsuura, Hokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1971, Ser. No. 213,026

Claims priority, application Japan, Dec. 30, 1970, 45-123084

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.5 R 4 Claims



This is a process for automatically and continuously detecting the flaws in the top-and bottom side, the both edge sides and the inside of hot-rolled plate with ultrasonic wave, which is a pulse reflection method with water film coupling using TR-probe. Such detecting process may be easily put into practice with the Sequence combining the moving of said plate with the going-up and down of a stopper and the moving of each of the top-and bottom testers, two edge testers and the selectable inside tester.

3,815,409

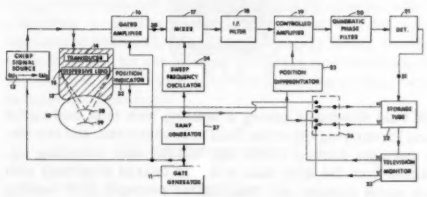
FOCUSED SONIC IMAGING SYSTEM

Albert Macovski, 4100 MacKay Dr., Palo Alto, Calif. 94301

Filed Feb. 15, 1973, Ser. No. 333,128

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.9 17 Claims



A chirped or frequency modulated sonic wave is passed through a dispersive lens whose focal length varies with frequency. Thus the different frequencies in the sonic wave focus at different depths in the object. The reflected energy is applied to a band pass filter so as to respond to the particular depth being received.

3,815,410

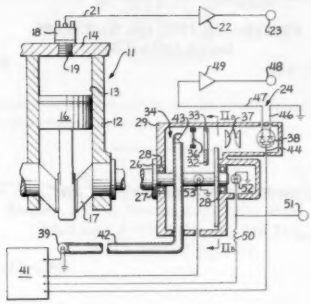
ENGINE THERMODYNAMIC CYCLE ANALYSER

William L. Brown, Jr., Peoria; John L. Hoffman, East Peoria, and Maurice E. Schaefer, Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 7, 1972, Ser. No. 313,115

Int. Cl. G01m *15/00*

U.S. Cl. 73—115 10 Claims



Instumentation attachable to an engine provides for a rapid and highly accurate measurement of power produced at the face of a piston in terms of Indicated Mean Effective Pressure or other indicated power units and may also provide a thermodynamic cycle diagram display and other data of interest in analyzing engine performance. A pressure transducer at the combustion chamber provides an electrical signal indicative of instantaneous pressure while a volume signal generator coupled to the engine crank shaft provides a voltage proportional to instantaneous combustion chamber volume. A circuit differentiates the volume signal to obtain a piston velocity signal which is multiplied by the instantaneous pressure signal and averaged for readout at a digital volt meter in terms of Indicated Mean Effective Pressure or the like. The volume signal generator also produces accurate top dead center and bottom dead center pulses to control gating means for obtaining information applicable to selected portions of the total engine cycle and for facilitating calibration.

3,815,411

ENGINE TEST EQUIPMENT

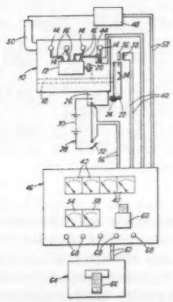
Reginald Stanley Emerson, Buckinghamshire, England, assignor to Leslie Hartridge Limited, Buckingham, England

Filed Sept. 12, 1972, Ser. No. 288,442

Claims priority, application Great Britain, Sept. 15, 1971, 43050/71

Int. Cl. G01m *15/00*

U.S. Cl. 73—117.3 19 Claims



Engine test equipment comprising a transducer which can be positioned, or is positioned, adjacent a rotatable engine

part which, in operation of the engine, rotates at a rate corresponding to or dependent on the rate of rotation of the engine crankshaft, the rotatable engine part being provided with at least one mark (as defined herein) the passage of which past the transducer is detected by the latter.

3,815,412
WIND DIRECTION INDICATOR

Melville Keim, 933 Via Lido Soud, Newport Beach, Calif. 92660

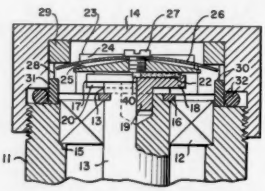
Filed Mar. 30, 1972, Ser. No. 239,686
Int. Cl. G01w *1/00*
U.S. Cl. 73—188 **7 Claims**

A flexible cloth strip having adhesive tape extending from a first end of said strip approximately one half of the length of the strip, which tape holds against the strip a plastic monofilament bristle which extends from a first intermediate point on the strip partway toward the second end of the strip; said tape having fiberglas strands extending the length of the tape along the length of the strip; said strip being split longitudinally at said first end to form two ties with reinforced tape on each of said two ties. Said indicator also including a flat anchor member having a first hole at one point through which the ties are extended and then brought back around the strip and tied to secure thereby the strip to the anchor member, which anchor member has a split ring at a second point through which may be received a stay.

3,815,413
ANEMOMETER WIND DIRECTION DAMPING SYSTEM

Thomas E. Marshall, III, Bedford, Va., and Walter A. Von Wald, Jr., Hillcrest Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1973, Ser. No. 324,269
Int. Cl. G01w *1/00*
U.S. Cl. 73—188 **4 Claims**

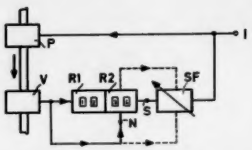


This disclosure is directed to a friction means which damps rotational movement of a weather vane due to wind shifts. The friction means is mounted relative to the vertical support shaft about which the vane rotates to align with the wind direction. The friction means prevents quick rotational movements of the support shaft so that more accurate true wind direction is obtained.

3,815,414
METHOD OF INCREASING THE MEASURING RESOLUTION OF A FLOW MEASURING INSTRUMENT WHERE THE FLOW IS DIVIDED INTO SECTIONS OF WELL DEFINED VOLUME

Karl Bertil Hellstrom, Appollanagen 17, 170 24 Skalby, Sweden

Filed Apr. 25, 1972, Ser. No. 247,461
Claims priority, application Sweden, May 5, 1971, 5846/71
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 E **3 Claims**

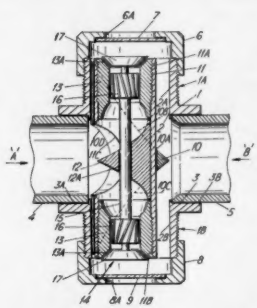


The resolution of a device, which measures the flow of liquid in a tube by producing a series of signals each of which corresponds to the passage through the tube of a predetermined volume of liquid, is increased by the introduction of additional signals at a rate which is a predetermined multiple of the basic signals and utilizing these additional signals, coordinated with the basic signals, to indicate the passage through the tube of fractional amounts of the volume measured by each of the basic signals.

3,815,415
ROTARY FLOWMETER

William Alexander Wemyss, and Anthony Charles Wemyss, both of West House, London Rd., Great Missenden, England

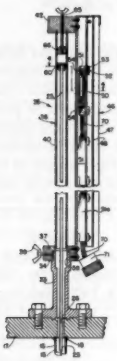
Filed Nov. 28, 1972, Ser. No. 310,183
Claims priority, application Great Britain, Nov. 30, 1971, 55578/71
Int. Cl. G01f *1/00*
U.S. Cl. 73—231 R **12 Claims**



A fluid flowmeter having a housing with inlet and outlet ducts for carrying the entire fluid to be measured, and two stator passages formed within the housing and extending oppositely from the inlet duct, a seat in coaxial alignment with each stator passage and two further passages each leading from a respective stator passage to communicate with the outlet duct. A rotor is disposed in the stator passages to be driven by the fluid flow and the rotor includes two bearing heads mounted at each end of the motor for cooperation with their respective seats. The heads also include a fluid turbine mounted adjacent to each head and a spindle connecting the turbines and the heads. The turbines are pitched so as to rotate the spindle in the same direction. A clearance is pro-

vided between the heads and the seats so that either both the heads are unseated or one of the heads is seated while the other remains unseated during the operation. The bearing head may be replaced by a disc or the disc can be eliminated so that the end of the spindle includes only a turbine, so that fluids of different viscosity can be measured.

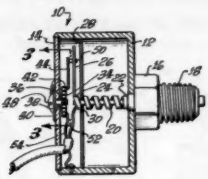
3,815,416
CONTROL SYSTEM FOR ROD TYPE TANK GAGE
Ralph G. Portis, Highland Park, Ill., assignor to Midland Manufacturing Corp., Skokie, Ill.
Filed Oct. 6, 1972, Ser. No. 295,735
Int. Cl. G01f 23/12
U.S. Cl. 73—306 **8 Claims**



A control system usable with any of a number of similar rod type tank gages having a gaging rod extensible from a tank and a float member within the tank connected with the rod for positioning same in accordance with liquid level, the control system having structure mountable on the tank for cooperation with the gaging rod, a magnetized member on the gaging rod exterior of the tank, at least one switch on the structure adapted to be actuated by the magnetized member and electrical conductors leading from the switch and adapted to be connected to remote control apparatus such as audio, visual, or valve actuating means responsive to switch action. In more detailed aspect, the control system has a plurality of switches responsive to different liquid levels, and a fail-safe stop member for the gaging rod, together with means responsive to engagement between the gaging rod and the stop member for indicating a malfunction condition. The control system operates at extremely low electrical energy levels, rendering the system safe for use in hazardous areas, and the conductors leading from the switches extend to control apparatus located in non-hazardous areas.

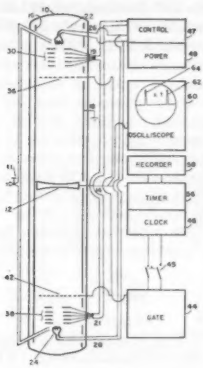
3,815,417
COMPENSATED PRESSURE INSTRUMENT
Edward H. Smialowicz, Point Pleasant, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Nov. 10, 1971, Ser. No. 197,327
Int. Cl. G01k 1/00
U.S. Cl. 73—345 **3 Claims**

A pressure indicating instrument has a temperature indicating needle swingably disposed adjacent its pressure indicating needle for providing temperature compensated pressure data at the immediate location. Make and break contacts on the



needles may be connected in an electrical circuit to provide the data to remote locations.

3,815,418
GRAVIMETERS
John S. Bradley, 3355 S. Braden Ave., Tulsa, Okla. 74135
Filed Sept. 5, 1972, Ser. No. 286,319
Int. Cl. G01v 7/00, 7/14
U.S. Cl. 73—382 **4 Claims**

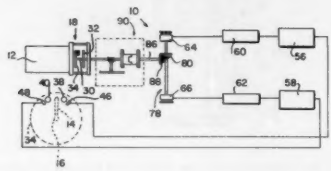


This invention relates to a novel accelerometer. A charged particle within an envelope is projected as a free body at a given velocity over a fixed distance to a target within the envelope. Any acceleration of the envelope in the direction of the flight is measured as a differential time of flight from a non-accelerated time of flight. If the axis of the instrument is vertical, the difference of travel time of upward and downward flights is a function of the force of gravity at that location. Various modifications of the accelerometer as a gravimeter, as an airborne or marine gravimeter, as a borehole densitometer, for example, are given.

3,815,419
AUTOMATIC RESET SYSTEM FOR ALTITUDE ENCODING
Earl W. Springer, Box 220, Fairland, Ind. 46126
Filed Apr. 18, 1973, Ser. No. 352,319
Int. Cl. G01c 21/00
U.S. Cl. 73—384 **27 Claims**

In an encoding altimeter of the type including an encoder and one or more motors for driving the encoder in response to the output of a barometric element, a setting and resetting system including, in addition to the basic and primary barometric element, an altitude sensor for providing a first electrical output corresponding approximately to the altitude being sensed, a feedback device for providing a second electrical output corresponding to the altitude position of the en-

coder, the feedback device being drivingly connected to the motor or motors for movement with the encoder, and a control circuit arrangement including a switch system for transferring the controls of the motor or motors to the said barometric element when the said first and second electrical outputs are balanced.

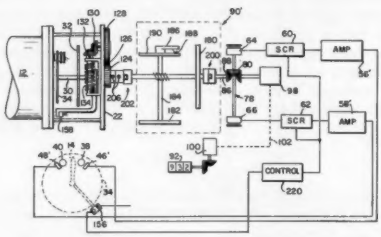


3,815,420

ALTITUDE ENCODER SYSTEM WITH FOOT MARKER RESET

Earl W. Springer, Box 220, Fairland, Ind. 46126

Filed Aug. 24, 1973, Ser. No. 391,073
Int. Cl. G01c *21/00*
U.S. Cl. 73—384 **20 Claims**



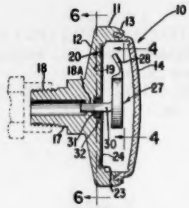
An altitude encoding system comprising a conventional altimeter having a 100 foot pointer and a pointer conventionally known as the foot marker, first electro-optical apparatus for tracking the movement of the 100 foot pointer and second electro-optical apparatus for finding the foot marker. The tracking apparatus and the finding apparatus include, respectively, first and second supports mounted for rotation about the axis of the altimeter with a 100:1 reduction gear arrangement drivingly connecting the second support to the first support. The reduction between the 100 foot pointer and the foot marker is 100:1 such that, when the first support moves with the 100 foot pointer, the second support moves with the foot marker. Stepping motors are provided for driving the supports as well as an encoder. The tracking apparatus and the finding apparatus include lights for projecting light at the paths of movement of the pointer and the foot marker and light-responsive cells for receiving the light reflected from the pointer and the foot marker. The finding apparatus is deactivated during the normal operation mode, i.e., the tracking mode. The tracking apparatus is deactivated during the finding mode, i.e., the setting and resetting mode. The activation and deactivation of these apparatus involves disconnecting their light sources and/or their light-responsive cells. During the resetting of the system, the finding apparatus is energized to find the foot marker. By driving the system to find the foot marker, I automatically set the tracking apparatus and the encoder at the proper altitude for continued tracking and encoding operations.

3,815,421

GAUGE WITH CEMENTED BOURDON

Philip W. Harland, Perkasie, and Ralph D. Waite, Sellersville, both of Pa., assignors to Amtek, Inc., New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,669
Int. Cl. G01l *7/04*
U.S. Cl. 73—418 **5 Claims**



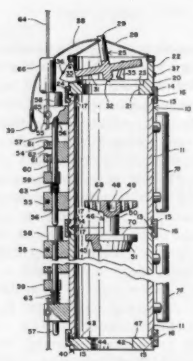
A pressure gauge of the Bourdon tube type, especially useful in conjunction with fire extinguishers, has an annular recess formed within the cylindrical casing and the periphery of the dial face is resiliently held in place by suitable means. The Bourdon tube is sealed at the pointer end and is formed into a planar multi-turn spiral with the other end extending radially at substantially right angles to the spiral and sealingly secured within the supporting post by means of an adhesive.

3,815,422

MULTI-CAPACITY WATER SAMPLER

Shale J. Niskin, 2629 S. Bayshore Dr., Miami, Fla. 33133

Filed June 4, 1973, Ser. No. 366,771
Int. Cl. G01n *1/12, 1/08*
U.S. Cl. 73—425.4 R **8 Claims**



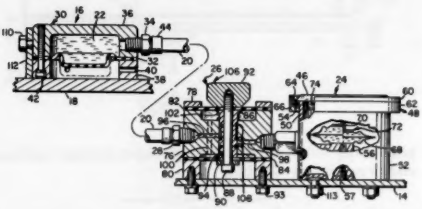
A water sampler device for obtaining samples of ocean water at designated depths consisting of a plurality of tubular members of identical shape and size clamped together to form a receptacle of any desired capacity with a closure or valve for both ends of the receptacle yieldingly maintained away from the upper opening to permit sea water to flow through the receptacle as it is lowered and sinks to the desired depth of water. Upon release of a messenger, the closures are released simultaneously whereby the lower closure passes through the upper opening to become seated on the lower opening while the upper closure seats on the upper opening to be locked in position by a plurality of cams. The weight of the water trapped in the receptacle maintains the lower cap in a sealed position on the lower opening as the sampler is brought to the surface of the ocean.

3,815,423

HYDROSTATIC ALTIMETERS AND METHODS OF USE

Walter S. Gearhart, College, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed May 27, 1971, Ser. No. 147,448
Int. Cl. G01c 9/22, 5/04
U.S. Cl. 73—432 HA 37 Claims



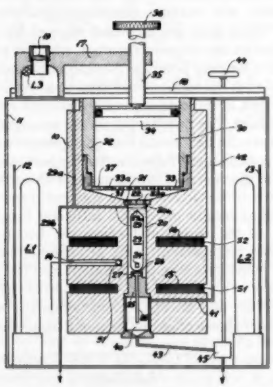
Ruggedized hydrostatic altimeters for determination of elevation differentials of construction equipment have specific features designed to withstand hard shocks, constant vibration, and sharp decelerations — a fully compliant sensor diaphragm, a constant volume, normally-closed gauge protection valve, and a manually rotatable gauge dial. A modified model for contour surveying includes (1) length markings along the connecting tubing to enable true horizontal distance readings and (2) a faired arrow-shaped sensor configuration to facilitate pulling over rough terrain. Special methods of use are associated with these features.

3,815,424

APPARATUS FOR FILTERING AND DENSITY DETERMINATION OF A LIQUID

Poul Erik Aegidius, Hillerod, Denmark, assignor to N.K. Verwaltungs AG, Zug, Switzerland

Filed Mar. 8, 1972, Ser. No. 232,719
Claims priority, application Denmark, Mar. 9, 1971, 1082/71
Int. Cl. G01n 9/14
U.S. Cl. 73—453 12 Claims



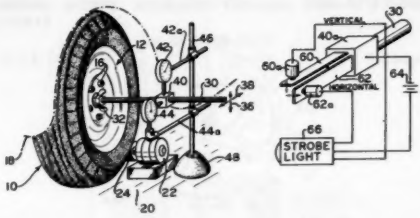
An apparatus for filtering and density determination of a liquid, particularly of fat extracted by wet grinding in a solvent, and of the type having a magnetically actuated float movable within a chamber, characterized in that the float chamber (20) and a filter (32–34) connected thereabove are enclosed in a substantially massive metal body or metal block (10) provided with thermostatic control.

3,815,425

SYSTEM FOR WHEEL BALANCING

Frank O. Skidmore, 2513 Third St., Cuyahoga Falls, Ohio 44221

Filed Oct. 24, 1972, Ser. No. 299,901
Int. Cl. G01m 1/22, 1/28
U.S. Cl. 73—457 13 Claims



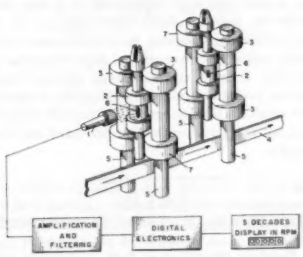
Apparatus is provided to effect a static and dynamic balance of a pneumatic tire and wheel combination in place on a vehicle or on a test stand. The technique involves measuring vibrations which occur on the mounting axle extended in at least two directions substantially 90° displaced from each other, translating the vibrations into usable information to indicate the position and the amount of weight that should be added to the tire rim combination to achieve a balancing to reduce the vibrations to below predetermined minimum requirements. The axial extension can be of variable length, but preferably in firm abutting relationship to the actual mounting axle of the wheel so that vibrations are accurately transferred to the axle extension. The wheel is spun up to a desired rotating speed to achieve the vibration measurements desired. Typical measurement systems might include a motion analyzer with magnetically attached transducers, or a unique electrical circuit combination with a strobe light to indicate the place and amount of weight necessary to achieve a proper balance.

3,815,426

MEASUREMENT OF SPEED OF ROTATION BY SONIC AND ULTRASONIC FREQUENCIES SPECTRUM

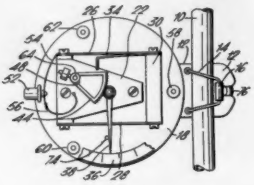
Dieter Rohner, Hausen, Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 7, 1972, Ser. No. 278,586
Claims priority, application Germany, Aug. 17, 1971, 2141068
Int. Cl. G01p 3/14, 3/42
U.S. Cl. 73—488 3 Claims



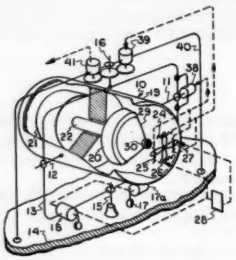
Apparatus and process wherein the center frequency of the narrow-band level peak of the sonic and ultrasonic spectrum produced by the false-twisting machine, which is directly proportional to the rotational speed of the spindles, is used for rotational speed measurement on false-twist spindles.

3,815,427
ACCELEROMETER
Robert Gladstone, Weybridge, England, assignor to Olympus Optical Company Limited, Tokyo, Japan
Filed June 13, 1972, Ser. No. 262,262
Claims priority, application Japan, June 24, 1971, 46-45236; Feb. 10, 1972, 47-16900
Int. Cl. G01p 15/02
U.S. Cl. 73—493 4 Claims



An accelerometer for providing direct measurement of the velocity of the head of a golf club by attaching to the shaft of the golf club the accelerometer comprising an inertia mass in its chassis supported by spring means for movement relative to and parallel to the gold club shaft when the club is swung. The deviation of the inertia mass is indicated by an indicating means able to give a stational and definite indication.

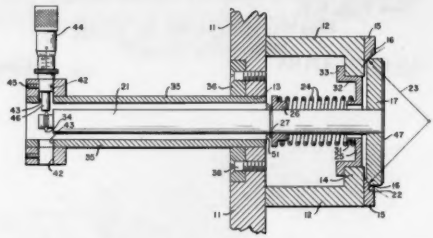
3,815,428
GYROCOMPASSES
Edwin W. Howe, North Baldwin, N.Y., assignor to Gyrosystems, Inc., Farmingdale, N.Y.
Filed Aug. 10, 1971, Ser. No. 170,443
Int. Cl. G01c 19/28
U.S. Cl. 74—5.4 16 Claims



A simplified gyrocompass including a primary reference gyroscopic wheel which is supported in a two axis gimbal system, with an inertia wheel which serves as a primary directional stabilization means. Included is two axis torquing means which replaces conventional high response positional control motors. A third stabilizational gimbal which is normally required is eliminated and replaced by a signal modifier sensitive to cross tilt displacement. A simplified displacement sensing and torquing system is also provided for the primary reference gyro.

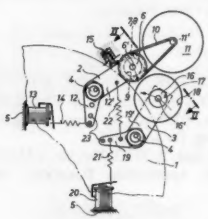
3,815,429
PRECISION NON-TRANSLATING MIRROR/LENS MOUNT
Harold S. Goulart, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 19, 1973, Ser. No. 352,829
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 7 Claims

A mirror mounting and adjusting means which permits precise, remote, adjustment of the fully reflecting mirror in a



laser cavity within an environment subject to large mechanical and/or acoustical vibration.

3,815,430
A REVERSIBLE, FRICTIONAL DRIVE ASSEMBLY
Roland Strobel, and Peter Frerichs, Wilhelmshaven, both of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed June 4, 1973, Ser. No. 366,261
Claims priority, application Germany, June 30, 1972, 2232149
Int. Cl. F16h 17/00
U.S. Cl. 74—203 7 Claims

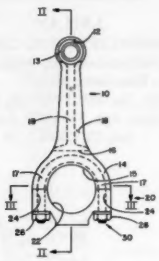


A gear driving assembly for selectively driving a wheel in the forward and reverse directions, including a forward stepped friction gear and a reverse stepped friction gear each disposed on its own support member, which is pivotable about a respective bearing point, and control apparatus operatively associated with the support members to selectively cause each of the friction gears to be separately pivoted into engagement with the wheel. The bearing points are arranged such that the friction gears can be pivoted into engagement with each other. A spring is connected between the support members to urge the friction gears out of engagement with each other. When the wheel is to be driven in the forward direction, however, the control apparatus provides a sufficient force to overcome the force of the spring and cause the friction gears to be pivoted into engagement. This arrangement of the friction gears, the respective support members and the spring forms a closed chain of links when the wheel is to be driven in the forward direction and an open chain when the wheel is to be driven in the reverse direction or is in a stop position.

3,815,431
CONNECTING ROD ASSEMBLY
Bernard V. Alvarez, Rt. 1, Box 32, Inman, S.C. 29349
Filed Dec. 1, 1972, Ser. No. 311,326
Int. Cl. F16c 7/02, 7/08
U.S. Cl. 74—579 E 7 Claims

A connecting rod assembly of the type for use in an internal combustion engine is disclosed herein. The rod comprises a shank having a piston pin bearing receiving opening at one

end and a large bearing receiving area at an opposite end. A connector passageway is provided adjacent the large bearing receiving area and a removable U-shaped connector is passed therethrough. The connector is then secured to a cap which provides a complementary large bearing receiving area so as to define a crank shaft bearing receiving opening in the lower



end of the rod assembly. The U-shaped connector affords greater strength to the rod when subjected to the compressive and tensile stresses experienced during operation of the internal combustion engine. Moreover, a rod produced at least in part from die cut metal plates incorporating the U-shaped connector is also provided.

3,815,432

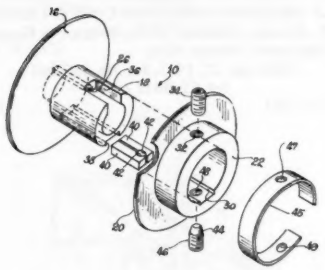
ADJUSTABLE PULLEY

Joseph E. Maurey, Chicago, and James D. Campbell, Lombard, both of Ill., assignors to Maurey Manufacturing Corporation, Chicago, Ill.

Filed Oct. 4, 1972, Ser. No. 294,891

Int. Cl. F16l *55/52*

U.S. Cl. 74—230.17 B **14 Claims**



A pulley construction wherein a pair of flange members are mounted on a shaft, and wherein the hub of one flange member is received within the hub of the other flange member. The flange members are adjustably secured on the shaft whereby the size of the belt receiving groove between the flange members can be changed. The securing means comprise a wedge defining side edges, and channels are defined in the hub for receiving the wedge. A set screw is receivable within an opening defined by one hub and within an aligned opening defined by the wedge. The wedge is preferably split so that movement of the set screw within the wedge opening operates to drive the wedge sections into engagement with the adjacent channel faces thereby tying the hubs together. A separate opening may be provided in either hub for receiving a set screw which serves to tie the assembly of flange members against movement relative to the shaft.

3,815,433

DRIVE MECHANISM FOR A CONVEYOR DEVICE FOR PRODUCING AN INTERMITTENT CONVEYING MOVEMENT IN ACCORDANCE WITH A DESIRED PATTERN OF MOVEMENT

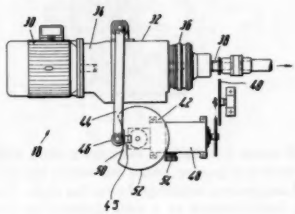
Kurt Klotzbach, Wittener Strasse 3, 4 Dusseldorf-Rath, Germany

Filed Sept. 7, 1972, Ser. No. 285,098

Claims priority, application Germany, Sept. 17, 1971, 2146518

Int. Cl. F16h *19/06*

U.S. Cl. 74—393 **3 Claims**



A drive mechanism for a conveyor device for producing an intermittent conveying movement in accordance with a desired pattern of movement comprises a motor driving an output shaft via an infinitely variable transmission the transmission ratio of which is variable in accordance with the position of a cam follower on a cam disc which is rotated by a further transmission driven by the output shaft.

3,815,434

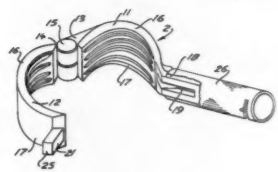
QUICK ACTION NUT ASSEMBLY FOR SCREW TYPE JACKS

Paul Robert Seger, Vancouver, B. C., Canada, assignor to George Wilburt Jackson, West Vancouver, British Columbia, Canada

Filed July 26, 1972, Ser. No. 275,187

Int. Cl. F16h *1/18*

U.S. Cl. 74—424.8 A **3 Claims**



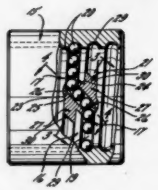
A quick action operating nut assembly for a screw of a screw type jack having a pair of hingedly interconnected complementally threaded nut halves swingable between an open position for receiving, or for removal from, the screw and a closed position for threadedly engaging the screw so that the nut assembly can be selectively applied to the screw at any desired position along its length. One of the nut halves has a radially extending arm and the other has a radially extending lug. A sleeve is slidably mounted on the arm moveable into and out of locking engagement with the lug when the nut halves are in a closed position.

3,815,435

BALL SCREW MECHANISM WITH IMPROVED BALL GUIDE

Rolf Eschenbacher, Nurtingen-Oberensingen, and Hans-Gunter Steinbrenner, Wendlingen, both of Germany, assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Nov. 24, 1972, Ser. No. 309,253
Int. Cl. F16h 55/22
U.S. Cl. 74—459 4 Claims



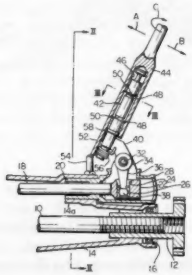
A ball screw mechanism includes a shaft with an external helical land and groove, and a nut which has an internal helical land and groove telescoped over the shaft. The nut rides on bearing balls located in a race defined by portions of the grooves of the nut and the shaft and the balls are recirculated continuously through the race as the nut turns relative to the shaft by means of a ball guide located in an opening through the side of the nut. A channel through the guide communicates between the ends of the race and passes over the land on the shaft to guide the balls from one end of the race to the other so the balls recirculate through the race. The balls hold the guide outwardly of the shaft and two projections extending laterally from opposite sides of the guide fit within the groove in the nut to keep the guide from being pushed through the opening while also holding the guide precisely in position so the opposite ends thereof deflect the balls into and out of the channel.

3,815,436

AUTOMOTIVE TRANSMISSION GEAR SHIFTING MECHANISM

Yoshiro Morimoto, and Kunihiko Suzuki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 2, 1973, Ser. No. 337,449
Claims priority, application Japan, Mar. 4, 1972, 47-26620
Int. Cl. F16h 57/06
U.S. Cl. 74—476 8 Claims



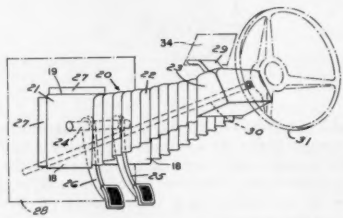
To prevent erroneous or accidental movement of a gear-shift lever to a position effecting shifting into reverse in a manually operated automotive power transmission system, the gear-shift lever is rotatable about its axis and urged to turn about the axis to a predetermined angular position in which the gear-shift lever is prevented from being moved to a position effecting the shifting into reverse even though the lever has been moved to a position selecting the reverse gear. The reverse gear is moved to an operative position only when the gear-shift lever is rotated about its axis from the predetermined angular position and further moved to a position moving the reverse gear to the operative position.

3,815,437

ENERGY ABSORBING STEERING COLUMN ASSEMBLY

John A. Martin, Southend-on-Sea, England, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 169,397, Aug. 5, 1971, abandoned.
This application Apr. 12, 1973, Ser. No. 350,436
Int. Cl. B62d 1/18
U.S. Cl. 74—492 12 Claims



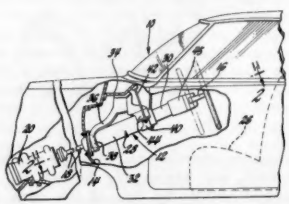
An energy absorbing steering column assembly in accordance with one preferred embodiment of this invention includes a forward pedal supporting section for the clutch and brake pedals, a corrugated intermediate energy absorbing section and a rearward steering shaft support section releasably connected to the instrument panel. The intermediate energy absorbing section is of channel shape and has three corrugated walls.

3,815,438

ENERGY ABSORBING STEERING COLUMN ASSEMBLY

Jeffrey L. Johnson, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1973, Ser. No. 355,264
Int. Cl. B62d 1/18
U.S. Cl. 74—492 5 Claims



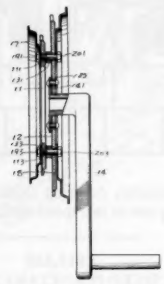
An energy absorbing steering column structure of the type including telescopically related mast jacket tubes and annular rows of deformer balls engaged therebetween with predetermined interference fit is further constructed to enable resetting of the column parts from a normal position to a rearwardly relocated position during vehicle front end impacts or the like. The energy absorbing rolling balls are permitted to freewheel during the resetting and present no resistance to the latter by virtue of being located in pockets in one of the tubes, while under forward collapse of the column the balls roll out of the pockets into full interfering engagement with the tubes to cause energy dissipation therein.

3,815,439

MULTI-SPEED TRANSMISSION FRONT GEAR SYSTEM

Satoshi Tarutani, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka Prefecture, Japan

Filed Oct. 20, 1972, Ser. No. 299,306
Int. Cl. F16p 1/00
U.S. Cl. 74—611 3 Claims



In a multi-speed transmission front gear system fixedly mounted to a crank shaft of a bicycle and provided with a plurality of different dent-numbered sprockets rotatable along with said crank shaft, chain guard members are mounted at each side of the minimum dent-numbered lowest speed transmission sprocket and the maximum dent-numbered highest speed transmission sprocket so that a driving chain can be prevented from getting off any selected one of said sprockets when shifted thereto, and further automatically shifted to such a sprocket even though the chain gets off the same.

3,815,440

SAFETY GUARD

Tom T. Mikulin, 1469 Bellevue Ave., Burlingame, Calif. 94010

Filed Mar. 16, 1973, Ser. No. 342,141
Int. Cl. F16p 1/00
U.S. Cl. 74—612 4 Claims

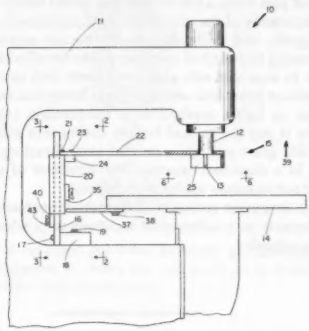
A safety guard for preventing injury to personnel adjacent machinery such as a punch press. A plurality of horizontally extending safety panels are connected at their ends to a pair of lazy tong mechanisms to permit the guard to be swung upwardly to an open position and to be swung downwardly to a closed position to cover the area to be protected.

3,815,441

TABLE ACTUATED CUTTER GUARD

Maurice V. Piepenbrink, Huntington, Ind., assignor to Caswell-Runyan Company, Inc., Huntington, Ind.

Filed Feb. 23, 1973, Ser. No. 335,241
Int. Cl. F16p 3/04
U.S. Cl. 74—615 7 Claims



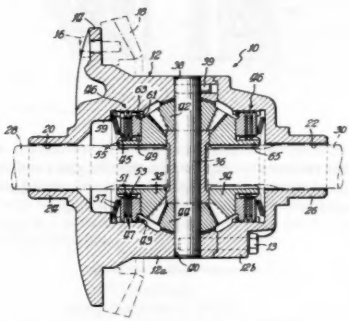
A guard surrounding a machine cutter which is movable away from the cutter upon movement of the work support table to a position adjacent the cutter. A frame mounted to the machine has a slide movably mounted thereon. A shield extending partially around the cutter is fixedly mounted to the slide. A stop mounted to the frame limits its downward movement of the slide and shield. A flange mounted to the table contacts and lifts the slide to move the shield away from the cutter as the table moves upwardly adjacent to the cutter.

3,815,442

DIFFERENTIAL MECHANISM

Herbert A. McAninch, Auburn, and Spencer H. Mieras, Fort Wayne, both of Ind., assignors to Borg Warner Corporation

Filed Oct. 27, 1958, Ser. No. 769,682
Int. Cl. F16h 1/44, 1/40
U.S. Cl. 74—711 18 Claims



In a differential mechanism the combination comprising a hollow casing adapted to be rotated, a plurality of pinion gears rotatably and revolably mounted in said casing, said casing having means defining a pair of openings, an output shaft received in each of said openings, a side gear affixed on the inner end of each of said shafts for limited axial movement with respect thereto, each of said gears being in mesh with said pinions and normally driven thereby at equal speed, at least one of said side gears and at least one of said pinion gears hav-

ing positive pressure angle teeth, said gears being normally relatively fixed with respect to said pinions and being relatively movable with respect thereto to afford differentiation, said casing having a splined bore adjacent the inner end of each of said output shafts, each of said side gears being formed with an axially outwardly extending externally splined hub, a disc pack received in each of said bores and being operatively connected to the splines of each of said bores and the splines of each of said hubs, each of said disc packs being disposed radially outwardly of the area of mesh of said pinion gears and said side gears, and Belleville washer means extending between said casing and each of said disc packs for effecting a first axial thrust to urge said side gears into mesh with said pinion gears, said pinion gears and said side gears being additionally characterized as being meshed in a relationship such that when torque is applied to said hollow casing said pinion gears and said side gears provide a second axial thrust against said disc pack in a direction opposite the direction of said first axial thrust substantially uniform peripheral.

This invention relates to differential mechanisms and more particularly to a differential mechanism in which differentiation is retarded.

3,815,443

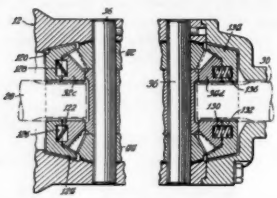
DIFFERENTIAL MECHANISM

Herbert A. McAninch, Auburn, and Spencer H. Mieras, Fort Wayne, both of Ind., assignors to Borg Warner Corporation, Chicago, Ill.

Division of Ser. No. 769,682, Oct. 27, 1958. This application Jan. 14, 1963, Ser. No. 262,814

Int. Cl. F16h *1/44*

U.S. Cl. 74—711 **4 Claims**



A differential mechanism having frusto-conical members wherein there are recesses within the side gears and the frusto-conical members containing spring means causing the frusto-conical members to engage the carrier casing.

3,815,444

FLUID COUPLING GEAR AND SPEED VARIATOR UNIT

Giovanni Pattarini, Saronno, Italy, assignor to Fabbrica Automobile Isotta Fraschini e Motori Breda S.p.A., Milan, Italy

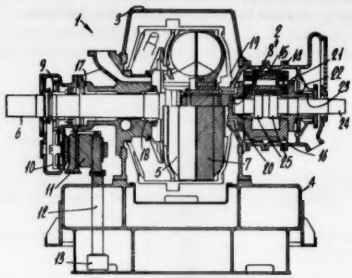
Continuation of Ser. No. 74,948, Sept. 24, 1970, abandoned. This application June 5, 1972, Ser. No. 260,005

Claims priority, application Italy, Feb. 23, 1970, 20992/70

Int. Cl. F16h *47/00, 1/28*

U.S. Cl. 74—732 **4 Claims**

A fluid coupling having annular primary and secondary coupling elements in a fixed housing wherein a rotatably mounted annular shroud in the fixed housing surrounds the



primary and secondary coupling elements enabling through planetary gearing one or two speed upshift.

3,815,445

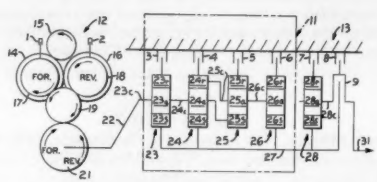
VARIABLE SPEED PLANETARY TRANSMISSION

James M. Gorrell, Morton, and James E. Winzeler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 11, 1972, Ser. No. 287,603

Int. Cl. F16h *37/00, 57/10*

U.S. Cl. 74—740 **10 Claims**



A variable speed transmission of the type including a succession of planetary gear trains is adapted to provide a relatively uniform step or percentage change between speed ratios in order to provide efficient use of vehicle power and to minimize peaks in the vehicle performance curve. Four disclosed embodiments are commonly characterized by one planetary gear train in the variable speed transmission having its carrier coupled to a ring gear of an adjacent planetary gear train on the power input side of the transmission with the sun gear of the one planetary gear train being coupled with the carrier of the adjacent planetary gear train.

3,815,446

SHARPENING APPARATUS FOR CIRCULAR SAW BLADES

Thomas J. Murphy, 79 Westchester Ave., North Babylon, N.Y. 11704

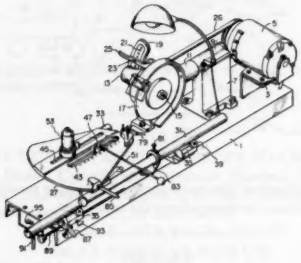
Filed Apr. 5, 1973, Ser. No. 348,358

Int. Cl. B23d *63/12*

U.S. Cl. 76—43 **11 Claims**

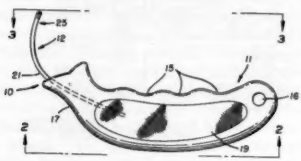
A sharpening apparatus for circular saw blades is described in which a carriage for a circular saw blade is mounted on a frame for movement to and from a grinding wheel carried by the frame. Horizontally disposed in spaced parallel relation on the carriage are a blade supporting table, a lower elongate table and a cross-plate. One end of the lower table carries an upstanding bearing housing for a drum-shaped spindle on which the blade supporting table rests and to which the blade supporting table may be locked anywhere along a first slot

therethrough for rotation thereof about the spindle axis. The one end of the lower table also carries a scissors clamp operable to clamp the spindle and prevent the blade supporting table from rotating about the spindle axis. The lower table is pivotally connected at its other end to the cross-plate with its pivotal movement being limited to a given angular range within the width of the frame and being capable of being held anywhere within that range to fix the angular position of the spindle axis with respect to the pivot axis of the lower table. A



second slot through the blade supporting table slidably supports an upstanding arbor for horizontally carrying a circular saw blade for rotation about the arbor axis, the arbor being lockable to the second slot anywhere along the length thereof. An index finger pivotally mounted on the blade supporting table is movable to and from an operative position where the end of the finger can engage the leading face of a tooth of the blade. The grinding wheel axis can be selectively angularly displaced, in a vertical plane normal to the carriage path, from a horizontal position at the level of the circular saw blade.

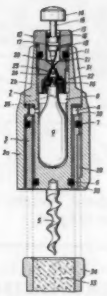
3,815,447
APPARATUS FOR REMOVING FOREIGN OBJECTS FROM TIRE TREADS
Remko C. Sterling, Clearbrook, Minn. 56634
Filed Apr. 7, 1972, Ser. No. 241,978
Int. Cl. B25b
U.S. Cl. 81—3 R **7 Claims**



An apparatus for removing foreign objects lodged in the tread portion of a tire which includes a blade member of uniform thickness that is secured to and extends outwardly obtusely from a handle, the end portion of the blade member having a transverse extension which terminates in a dull tip portion, whereby such apparatus conveniently permits the tip portion to be positioned relative to a foreign object lodged in a tire tread for the purpose of facilitating removal of the object.

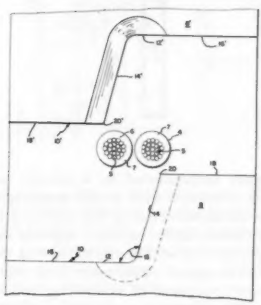
3,815,448
CORKSCREW
Gero Artmer, Parkgasse 2, A-1030 Vienna, Austria
Filed Oct. 10, 1972, Ser. No. 296,245
Int. Cl. B67b *7/08*
U.S. Cl. 81—3.2 **7 Claims**

A bottle opener has two parts which are slidable relative to one another and between which there is a pressure chamber. A corkscrew extends from one of these parts which has a cavity therein accommodating a valve and a gas cartridge. When the corkscrew is embedded in a cork in the neck of a bottle



and the valve is actuated gas flows from the gas cartridge to the pressure chamber to move the two parts away from one another so that the cork is extracted.

3,815,449
INSULATION STRIPPER & WIRE SEPARATOR FOR TWISTED WIRE PAIRS
Earl Earnest Folkenroth, and Robert Ullman, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 31, 1972, Ser. No. 258,334
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 **4 Claims**

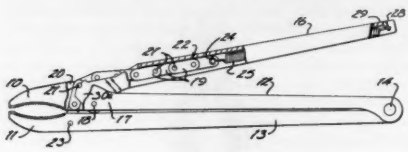


The insulation of each wire of a twisted wire pair is stripped by stripping blades which are effected to cut through the insulation of both wires of the pair. Also disclosed is an apparatus for stripping and untwisting the insulation from the end portion of a twisted wire pair.

3,815,450
PIPE GRIPPING TOOL
Raymond B. Nockleby, Rt. 1, Kalispell, Mont. 59901
Filed Mar. 26, 1973, Ser. No. 344,567
Int. Cl. B25b *13/34*
U.S. Cl. 81—111 **5 Claims**

A hand tool usable for gripping pipes or other objects comprises an opposed pair of jaws pivoted on integral extensions at a point remote from the jaws. One jaw pivotably mounts an elongated handle with pawl means at the pivoted end thereof. A leaf chain extends from the handle, over the pawl means to the opposite jaw where it is pivotably anchored. The handle

may be selectively pivoted to engage the chain with the pawl means, thereby forcing the jaws together, or to disengage the pawl means from the chain, thereby facilitating free movement of the jaws together or apart.



3,815,451
RELEASE DEVICE FOR SOCKETS INCORPORATED IN RATCHET WRENCHES

John Penner, Rt. 4-204 P. Hillcrest Dr., Brownwood, Tex. 76801

Filed Mar. 7, 1973, Ser. No. 338,890
Int. Cl. B25b *23/00, 13/06*
U.S. Cl. 81—184 7 Claims

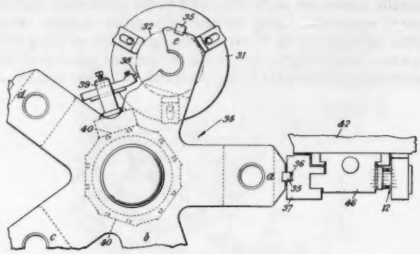
An improvement incorporated in a ratchet wrench to facilitate removal of sockets from socket engaging stud. The device comprises the construction of two socket ejector channels through the drive cylinder adjacent opposite sides of the socket engaging stud. The socket ejector having the general configuration of an elongated staple projects through the ejection channels and is capable of contacting and ejecting a socket from the drive stud when pressure is applied to the socket ejector head by the user.

3,815,452
MACHINE TOOLS

Herbert Wilhelmy, Northumberland, England, assignor to Machine Tool Divisional Services Limited, Coventry, Warwickshire, England

Filed Apr. 18, 1972, Ser. No. 245,094
Int. Cl. B23b *9/00*
U.S. Cl. 82—2 R 9 Claims

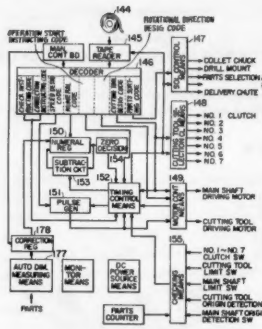
An automatic lathe comprising a rotatable chuck to carry workpieces to be machined, a multi-armed tool-carrying turret adapted to be indexed about an axis parallel to that of the chuck to bring the tools successively into working position and to perform feed and return strokes in a direction parallel to the axis of the chuck, a locating guide for engaging in succession tenons on the turret arms during the feed and return strokes of the turret, and adjusting means for moving the locating guide through a predetermined distance when the tenon on the selected arm is engaged in it to rotate the turret about its axis and thereby to vary the radial distance from the axis of the chuck of the tool which is in working position to the extent necessary to compensate for tool wear.



3,815,453
AUTOMATIC LATHE

Hirotugu Takano, and Toshitsugu Inoue, both of Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 38,695, May 19, 1970, Pat. No. 3,680,415.
This application Mar. 23, 1972, Ser. No. 237,582
Claims priority, application Japan, May 26, 1969, 46-42356
Int. Cl. B23b *13/00*
U.S. Cl. 82—2.5 4 Claims



An automatic lathe wherein a plurality of cutters are provided in confronting relation to a rotating rod material, and the movement of the said rod material and the said cutters are controlled according to a working information stored in a tape or card, whereby a complete parts is obtained automatically according to the said working information.

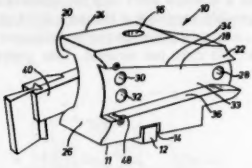
3,815,454
TOOL POSTS

Allan William Knott, 107 Salehurst Rd., London, England

Filed Apr. 12, 1973, Ser. No. 350,397
Claims priority, application Great Britain, Apr. 14, 1972, 17290/72
Int. Cl. B23b *29/00;* B26d *1/00*
U.S. Cl. 82—36 R 5 Claims

The invention described herein relates to a tool post for a lathe comprising one or more pairs of locating stations. The locating stations in a pair are inclined to each other and

disposed in a common plane and means are included for mounting the tool post upon a lathe. In use, when a tool or tool



holder is located in one of the stations in a pair, it is disposed in the said common plane.

3,815,455

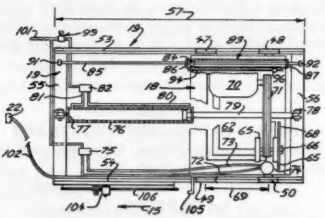
CUT-OFF APPARATUS FOR PIPE MACHINE

Herbert Daniel Carrell, and Adrianus Marinus Nyssen, 114 Windsor St., both of Chilliwack, British Columbia, Canada, assignors to said Nyssen, by said Carrell

Filed Oct. 5, 1972, Ser. No. 295,172

Int. Cl. B23d *25/16*; **B26d** *1/56*

U.S. Cl. 82—53.1 **13 Claims**



Cut off apparatus to cut continuously advancing pipe. Cut-off carriage carrying cut-off saw is fed in direction of advancement of pipe, by pneumatic feed cylinder, at speed equal to speed of pipe advancement. Acutation of pneumatic cylinder is restricted by hydraulic retarding cylinder secured to carriage, double-acting piston dividing retarding cylinder into two cylinder spaces. Conduit having fluid metering valve connects the two cylinder spaces so that actuation of feed cylinder moves hydraulic retarding cylinder relative to piston. Piston displaces fluid through conduit and metering valve, metering valve restricting flow and thus actuation of air cylinder. Automatic cut-off sequence controlled by limit switch connected to feed cylinder. Switch is actuated by pipe when pipe is at desired length. Air cylinder actuated by limit switches cooperates with saw, moving saw into and out of engagement with pipe, whilst the carriage is maintained at the same speed as pipe.

3,815,456

CONTROL SYSTEM FOR PRESS WITH SLIDING BOLSTER PLATE

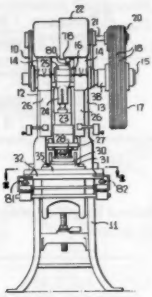
Finn N. Braathen, Chicago, and George J. Sirovatka, Berwyn, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed Aug. 24, 1972, Ser. No. 283,341

Int. Cl. B26d *7/24*

U.S. Cl. 83—68 **38 Claims**

A control system utilizable in conjunction with a conventional press having a reciprocating ram wherein the press is equipped with a bolster plate movable from a retracted loading position to an advanced position cooperable with the ram. The control system includes a mechanism which is manually controllable and which requires the operator's hands to be in an out-of-the-way position both during the advance of the bolster plate and during the reciprocation of the ram. Failure



to properly actuate the control mechanism results in the automatic retraction of the bolster plate and the rendering of the ram inoperable.

3,815,457

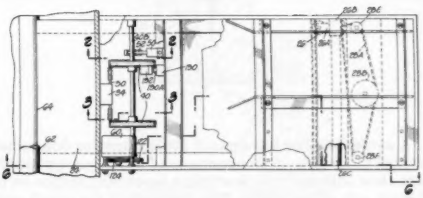
EQUIPMENT USING NOVEL PAPER STORAGE MEANS

Lawrence E. Shimmin, San Diego, Calif., assignor to The Copley Press, Incorporated, La Jolla, Calif.

Continuation of Ser. No. 829,305, June 2, 1969, abandoned. This application Oct. 6, 1971, Ser. No. 187,142

Int. Cl. G03d *3/12*

U.S. Cl. 95—94 R **12 Claims**



Paper storage, paper cutting and paper dispensing means are incorporated in a phototypesetting machine to allow a person to select various lengths of photosensitized copy material for delivery to a developer. Once the person makes a selection by operating a switch, paper is cut, withdrawn from the storage area and delivered into an attached developer. The phototypesetting process is interrupted only momentarily to accomplish this selection.

3,815,458

MACHINE FOR CUTTING NON-RIGID MATERIALS

Arthur E. Jirousek, Bloomington, Minn., assignor to Anderson Machine and Tool Works, Inc., Chaska, Minn.

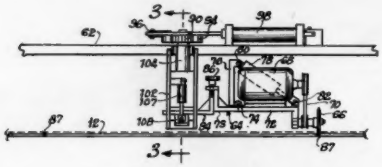
Filed May 1, 1972, Ser. No. 248,961

Int. Cl. B26d *5/04*, *5/12*, *7/02*

U.S. Cl. 83—83 **22 Claims**

This invention is addressed to a machine for cutting non-rigid materials advanced over a cutting surface for being cut into the desired pattern. The machine includes a radius cutter formed of a spindle rotatably mounted above the cutting surface and having an arm extending outwardly therefrom carrying a rotary knife. The radius cutting assembly also includes means for fixing the rotatable knives and means for rotating the spindle to advance the rotary knife through an arcuate path of the cutting surface. The apparatus can also be provided with slitting knives which are adapted to be raised and

lowered from and toward cutting relationship with the non-rigid material on the cutting surface to trim the non-rigid

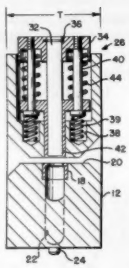


material into the desired length or otherwise form longitudinal slits in the non-rigid material.

3,815,459
UNITIZED TOOLING

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., Seattle, Wash.

Continuation-in-part of Ser. No. 269,983, July 10, 1972, abandoned. This application Nov. 6, 1972, Ser. No. 304,100
Int. Cl. B26f *1/02*
U.S. Cl. 83—140 **7 Claims**



A unitized tooling has a punch guide extending down a substantial distance from an upper arm of a C-frame type holder into close adjacency to a workpiece supporting surface on the bottom arm of the holder. The thickness of the punch guide along the longitudinal length or throat depth of the holder is substantially less than the thickness of the punch guide at right angles to the throat depth so that structural workpieces such as angles or channels having legs at right angles to one another can be punched with the leg facing up and with the leg positioned on either side of the punch guide.

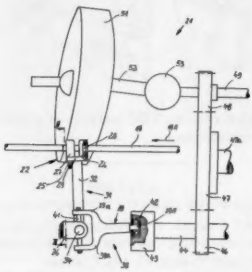
A second embodiment includes a lower arm of a C-frame type holder which includes an upwardly extending die holder of a thickness along the longitudinal length of the holder substantially less than the thickness of the die holder at right angles to the longitudinal length of the holder in a manner similar to that of the punch guide so that I-bars or the like can be punched close to their end legs.

3,815,460
APPARATUS FOR SEVERING WRAPPED TOBACCO RODS OR THE LIKE

Dietrich Bardenhagen, Hamburg, Germany, assignor to Hauni-Werke Koerber & Co. KG, Hamburg, Germany

Filed Apr. 2, 1973, Ser. No. 347,346
Claims priority, application Germany, Apr. 22, 1972, 2219850
Int. Cl. B26d *1/56, 3/16*
U.S. Cl. 83—310 **15 Claims**

A severing apparatus for cigarettes rods wherein a knife orbits along an endless path which intersects the path of the rod and wherein the knife moves during severing in the same direction and at the speed of movement of the rod employs a tubular guide assembly which surrounds the rod and constitutes a counterknife for the orbiting knife. The drive for the knife includes a Rzeppa joint and the drive which oscillates the guide assembly employs a Hooke's joint or an eccentric drive to thus reduce noise when the knife severs the rod at the rate of up to 70 cuts per second. The guide assembly is

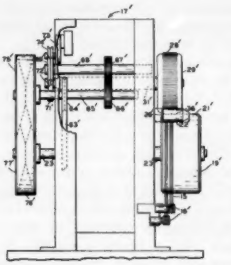


mounted on the light metal arms of a carrier whose shaft is turnable in fixed bearings by a pair of motion transmitting pins which form part of the Hooke's joint or by a fork which forms part of the eccentric drive. When the drive for the guide assembly employs a Hooke's joint, its input shaft is parallel to the input shaft of the drive for the knife, and one of these input shafts drives the other input shaft by a train of spur gears or by a power train which utilizes a toothed belt.

3,815,461
APPARATUS FOR CHOPPING STRAND

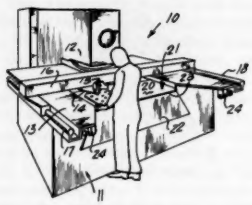
Samuel Richard Genson, Weston, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.

Filed Oct. 26, 1972, Ser. No. 300,960
Int. Cl. B23d *25/12*
U.S. Cl. 83—347 **11 Claims**



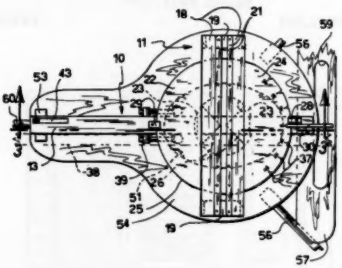
Strands of glass filaments are advanced directly from the bushings in which they are formed to a chopper. The chopper is arranged to issue short lengths of strand along a generally horizontal trajectory to deposit the strand on a conveyor with a component of motion in the conveying direction. Cantilever mounted blade, and back-up rolls have their axes horizontal and are generally one above the other. Starting of the strand is facilitated by a back-up roll of substantially greater axial length than the blade roll so that strand can be carried over a guide and at least partially around the unobstructed, free end of the back-up roll to initiate the pulling of the strand. A hold-down roll having a tapered nose and of an axial length intermediate that of the back-up roll and blade roll is brought into pressure engagement with the back-up roll after the initial strand turn is taken. The drive of the blade roll and back-up roll at the filament pull speed of the bushing is quickly achieved as the strand guide, aligned with the blade roll, directs the strand along a helical path and into the blade roll.

3,815,462
PUNCH PRESS
Harold Kaufmann, Rochester, Minn., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Apr. 27, 1973, Ser. No. 355,144
Int. Cl. B26f 1/02; B26d 7/06
U.S. Cl. 83—410 10 Claims



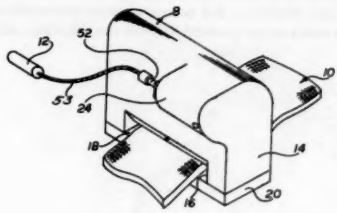
A punch press has punch and die tooling supported on a pair of turrets carried by a frame, the turrets being surrounded by a workpiece-supporting table which forwardly overhangs the frame, a stylus and workpiece-clamping means are carried on a carriage supported for movement in the X and Y axes on said table, there being a recessed template-supporting table having a forward portion which is selectably pivotable between horizontal and depending positions, by which the effective size of a large machine is converted to a small machine.

3,815,463
MITER TABLE ASSEMBLY
Joseph Paul Allaire, 228 N.E. 22nd Ave., Apt. 4, Pompano Beach, Fla. 33062
Filed Jan. 31, 1973, Ser. No. 328,344
Int. Cl. B26d 7/02
U.S. Cl. 83—460 6 Claims



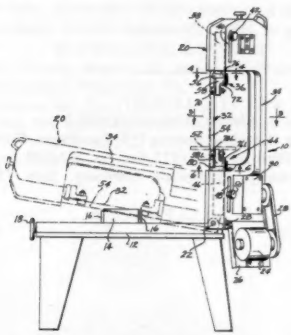
A miter assembly adapted to produce miter cuts with a power saw, such as a rotary handsaw, and comprising a table having collapsible legs, an elongated base secured onto the table, an aperture through each of the two opposite lateral sides of the base and defining a transverse channel through the latter, a frame pivoted onto the base about an upright axis through the channel, spaced-apart strips to support a saw in projection into the channel and to perform all the angular and inclined miter cuts into the same channel, a locking device to lock the frame for a selected angular miter cut, and a self-adjustable and yieldable clamping device to clamp a piece of work on either side of the elongated base and the underside of the frame.

3,815,464
GAS OPERATED SINGLE STROKE SERVO-MOTOR
Richard H. Frost, Littleton, Colo., assignor to Frost Engineering Development Corporation, Englewood, Colo.
Filed Jan. 17, 1973, Ser. No. 324,344
Int. Cl. B26d 5/12
U.S. Cl. 83—639 17 Claims



A gas operated single stroke servo-motor characterized by a partially collapsed tubular member cooperating with closures at both ends thereof to define a pressure vessel operative upon the introduction of a pressurized fluid therein to expand and, in so doing, drive a tool or the like connected thereto from a retracted into an extended position.

3,815,465
BAND SAW
Walter R. Smierciak, Elgin, Ill., assignor to Wilton Corporation, Schiller Park, Ill.
Filed Dec. 15, 1971, Ser. No. 208,180
Int. Cl. B23d 53/04; B26d 1/54
U.S. Cl. 83—820 2 Claims

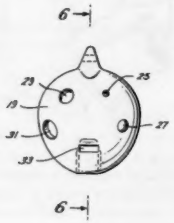


A metal cutting band saw is provided with guides for the cutting reach of the blade. With the band saw in upright position the guides hold the blade in the normal position, i.e., parallel to the axes of the rollers over which the blade passes. However, when the head of the band saw is tipped down to approximate a horizontal position, the guides are reset to twist the cutting reach of the blade on the order of 45° from its normal position to allow cutting of pieces which are too large otherwise to reach through the throat of the band saw.

3,815,466
FIPPLE FLUTE
Paul Conrad Johnson, P.O. Box 41, Austin, Tex. 78767
Filed Sept. 4, 1973, Ser. No. 394,363
Int. Cl. G10d 7/00
U.S. Cl. 84—380 6 Claims

A fipple flute includes an oyster shaped hollow body providing a resonant chamber, a whistle type mouthpiece in the rim

of the body chamber communicating with the resonant chamber and with the exterior through a slit in the body, and four pitch control openings in the resonant chamber of differing sizes, disposed at each side of a diametral plane through the body intersecting the mouthpiece and perpendicular to the rim plane, the holes spaced so as to be simultaneously engageable by fore finger and middle finger of each hand of the musician, the pitch hole sizes and locations relative to the resonant chamber enabling a full octave western chromatic scale of thirteen notes to be sounded without overblowing, an eye-



let at the rim opposite the mouthpiece being provided with a necklace for carrying the flute.

The four pitch control holes are disposed as at the corners of a trapezoid adapting same to a mnemonic musical notation consisting of a quartered square with shaded quarters corresponding to holes to be stopped.

The body is made in two halves initially separated along the rim and glued together; polyester resin being the body material and the glue of the same material. After joining the halves, the glue flash is trimmed and the instrument tuned by pitch hole reaming or filling. Decorative exterior finishes are applied.

3,815,467

ANCHORING ASSEMBLY

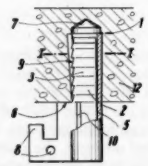
Artur Fischer, Altheimer Strasse 219, Tumlingen, Germany

Filed Jure 16, 1972, Ser. No. 263,429

Claims priority, application Germany, July 15, 1971, 2135333

Int. Cl. F16b *13/06*

U.S. Cl. 85—77 **8 Claims**



An anchoring assembly has an expansion sleeve having a longitudinal slot. An expansion body having a tapered portion made from a sheet metal bar which is in the form of a wave having crests of diminishing size towards the front of the expansion body, is engageable in the slot when the sleeve is forced onto the expansion body. At a point on the expansion body where the tapered portion has its narrowest dimension, the expansion body has an abutment means to limit penetration of the body into a hole and also has an outwardly projecting supporting portion.

3,815,468

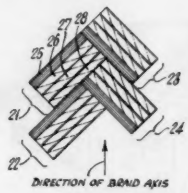
BRAIDED FABRIC BEARING LINER

Richard J. Matt, Simsbury, and Thomas P. Rolland, Portland, both of Conn., assignors to Textron Inc., Providence, R.I.

Filed Jan. 20, 1972, Ser. No. 219,259

Int. Cl. F16j *15/22*; **D02g** *3/04*; **D04c** *1/06*

U.S. Cl. 87—1 **14 Claims**



Improved wear and load-carrying properties result for a resin-impregnated braided-fabric bearing wherein the bearing surface includes, as the most significant fabric component, threads which in the aggregate present at the bearing surface TFE filaments and high-temperature nylon filaments in the proportion of less than 50 percent TFE by volume. The threads are the result of winding, substantially without twisting, of strands which are fully washable, to remove sizing down to the innermost filaments. This enables full impregnation of the fabric with synthetic resin, and curing in substantially intimate and continuous and void-free relation of the resin to all filaments within the threads of the fabric.

3,815,469

METHOD AND DEVICE FOR LAUNCHING MISSILES PARTICULARLY ANTITANK PROJECTILES

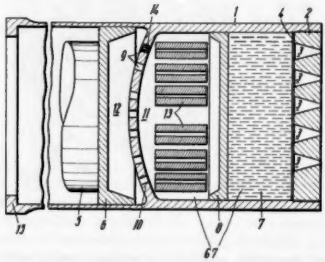
Johannes Schubert, Unterhaching, and Werner Schnabele, Wolfratshausen, both of Germany, assignors to Messerschmitt-BolkowtBlohm Gesellschaft mit beschrankter, Haftung, Germany

Filed July 24, 1973, Ser. No. 382,117

Claims priority, application Germany, July 29, 1972, 2237344

Int. Cl. F41f *1/00*

U.S. Cl. 89—1.701 **18 Claims**



A method of recoilless and concealed launching of missiles, particularly antitank projectiles, from launcher tubes open at both ends, comprises simultaneously accelerating the missile in the firing direction and a countermass in the opposite direction, using an inert, non-expansive and well dividable countermass of high specific gravity in a liquid, jelly-like, pulverulent, granular or mixed form, and imparting to the countermass a considerably higher, for example quadruple, exit velocity than to the missile, the weight and volume of the countermass being so dimensioned as to approximately balance the impulses and momenta at the two outlets. The

acoustical and optical signs of the power gas expansion into the open air are prevented by closing the openings at both ends of the launcher tube at the moment the missile and the countermass have been expelled. A device for carrying out this method comprises, within a common pressure-resistant tube or with pressure-resistant outer walls of the assembled parts, a missile compartment for receiving the missile and its driving piston, a countermass compartment for receiving the countermass and its driving piston, and a common cross-wall therebetween. The common cross-wall and the respective driving piston limit within the missile compartment a low pressure chamber, and within the countermass compartment, a high pressure chamber In these chambers, appropriately dimensioned power gas developing charges are placed or pressure gas is supplied therein from an outside source. The low pressure chamber may also be supplied with power gas from the high pressure chamber, through throttle openings which may be provided in the common cross-wall and, moreover, may be closed by inserts of fusible material permitting a control of the pressure development. To prevent signs of pressure gas expansion into the open air, the driving pistons in their outer positions close both ends of the device by abutting against annular stops. To simplify the recharge, the countermass compartment alone or together with the missile compartment are in the form of a preassembled package to be inserted in an outer tube. Also, the countermass compartment may be designed as a pressure-resistant case receiving a countermass quantity for several shots and a corresponding number of missil : compartments in the form of launcher tubes may be joined thereto.

3,815,470

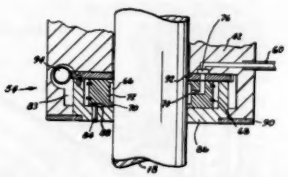
SERVO FEED SYSTEM FOR MACHINE TOOL PROVIDED WITH LOCKING MECHANISM

Thierry Goiffon, Ferney-Voltaire, France; Hans Rudolf Lehmann, Geneva, and Hubert Schaidl, Aire-Geneva, both of Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Division of Ser. No. 61,219, Aug. 5, 1970, Pat. No. 3,695,144. This application Sept. 28, 1972, Ser. No. 293,047

Int. Cl. F15b *15/26*

U.S. Cl. 91—41 **4 Claims**



A locking mechanism for a hydraulically actuated movable rod member of a machine tool, such as the electrode tool holder of an electron-erosion machining apparatus, consisting of a locking member preferably in the form of an annular expansible member surrounding a linearly and/or angularly displaceable rod member and normally biased in engagement with the surface of the rod member. The annular member is supported by a stationary element of the machine and normally engages the rod member so as to immobilize it in a predetermined position as long as the machine servo mechanism is not activated. When the machine servo mechanism is activated, pressurized fluid is introduced in a chamber dependent from the annular member, causing an expansion of the annular member releasing the rod member for normal actuation thereof by the servo mechanism.

3,815,471

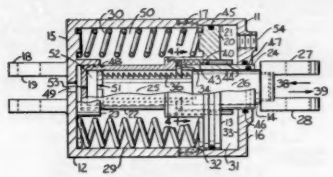
SELF-ADJUSTING LINEAR ACTUATOR

Jack R. Kobelt, 6110 Oak St., 13 Vancouver, British Columbia, Canada

Filed Mar. 30, 1972, Ser. No. 239,427

Int. Cl. F15b *11/18*

U.S. Cl. 91—189 **11 Claims**



This disclosure pertains to a novel linear actuator comprising a cylinder portion, a piston portion, and a rod portion. Self-adjusting means interconnecting the piston portion and rod portion is adapted, in response to cyclical movement of the piston portion along a linear stroke of fixed length inside the cylinder portion, to automatically increase the length of the rod portion with respect to the piston portion and cylinder portion. This length self-adjusting capability permits the use of mechanical or pneumatic springs to actuate the piston portion in a short stroke of fixed length whereas the rod portion will automatically extend to compensate for an increasing linear actuator length requirement. An example of where my subject invention may be used is a friction brake where cycling of the brake will automatically cause the linear actuator rod portion to increase in length so as to compensate for friction material wear.

3,815,472

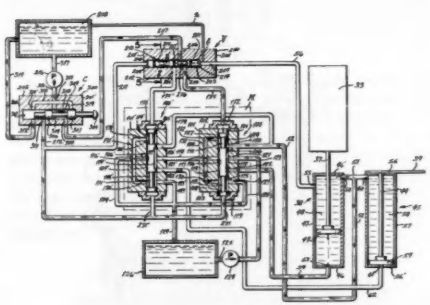
FLUID CONTROL SYSTEM

Ronald K. Schantz, Morton, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Division of Ser. No. 174,595, Aug. 25, 1971, Pat. No. 3,733,964. This application Feb. 15, 1973, Ser. No. 332,947

Int. Cl. F01i *15/00*

U.S. Cl. 91—189 **1 Claim**

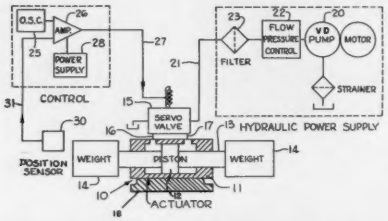


A fluid control system for an elevating scraper incorporating a master control valve for selectively directing fluid to a floor gate cylinder and an ejector gate cylinder, and a pilot sequence valve for sequentially operating said master control valve to assure that fluid will be initially directed to the floor gate cylinder and then subsequently to the ejector gate cylinder; there being a fluid line connecting the floor gate cylinder and the pilot sequence valve for passage of fluid to the latter after the floor gate has been fully extended.

3,815,473
VIBRATING APPARATUS

Clarence O. Jones, Jr., Eggertsville, N.Y., assignor to Derrick Manufacturing Corporation, Cheektowaga, N.Y.

Filed Sept. 22, 1972, Ser. No. 291,154
Int. Cl. F01l 25/08; F16j 15/18
U.S. Cl. 91—248 17 Claims

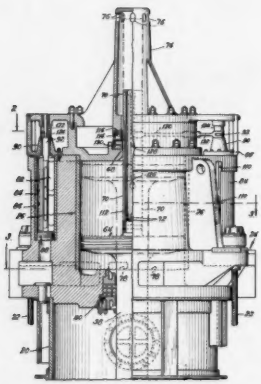


Apparatus for screening material by mechanical vibration of a screen member which is mounted for limited reciprocable movement. A hydraulic cylinder is fixed to the screen with its axis extending in the direction of vibration of the screen and the piston member in the cylinder has weights thereon to develop substantial inertia forces upon reversal of operating hydraulic pressure to opposite ends of the cylinder. An electro hydraulic servo valve connects operating fluid pressure alternately to opposite ends of the cylinder and alternating current electrical means produces reciprocations of the servo valve whereby the piston member reciprocates at a frequency in synchronism with the frequency of the alternating current means.

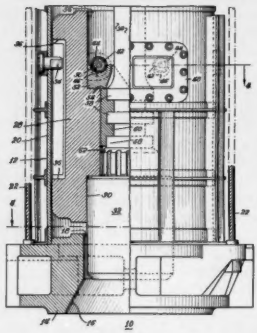
3,815,474
PILE DRIVING HAMMER

Henry G. Warrington, Palm Beach, Fla., assignor to Vulcan Iron Works Inc., Chattanooga, Tenn.

Filed June 4, 1973, Ser. No. 366,778
Int. Cl. F01l 31/18
U.S. Cl. 91—352 6 Claims



The pile driving hammer includes a fluid cylinder and a piston mounted in the cylinder for reciprocal movement and connected to drive a heavy hammer, a fluid passage for supplying pressurized fluid to and exhausting the same from a lower end of the cylinder below the piston, valve means operable between a supply position and an exhaust position for controlling fluid flow into and out of said lower end of the cylinder via said fluid passage means, operator means for controlling said valve means in response to the position of said piston in said cylinder includes a hollow stem extending axially upward of the piston for communication between the upper end of the cylinder and externally thereof, a cam surface carried by said

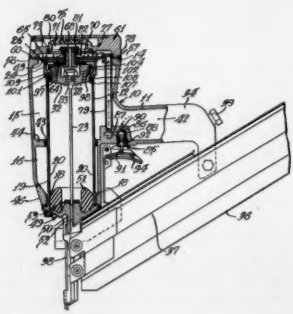


stem and a follower linkage engaging said cam surface is connected with said valve means for moving the same between said supply and exhaust position as said piston moves up and down within said cylinder.

3,815,475
FASTENER DRIVING TOOL WITH IMPROVED PISTON RETURN

Frank C. Howard, Mt. Prospect, and Steven J. Wilson, Evanston, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 20, 1972, Ser. No. 308,128
Int. Cl. F15b 15/22
U.S. Cl. 91—399 7 Claims

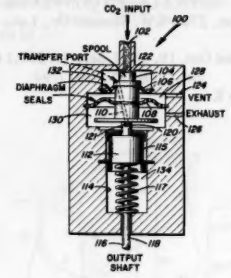


A fastener driving tool in which maximum efficiency is obtained from the air supplied to the tool by using high-pressure air to return the piston to its retracted position only after the tool has been operated. To this end, driving air is directed through the piston and an auxiliary chamber leading to the underside of the piston when the piston is in its fully driven position. Air on top of the piston is subsequently exhausted, which permits the air provided against the underside of the piston to return it.

3,815,476
GAS POWERED DRIVING UNIT FOR SURGICAL INSTRUMENT

David T. Green, Norwalk, and Graham W. Bryan, Ridgefield, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Division of Ser. No. 852,822, Aug. 25, 1969, Pat. No. 3,643,851. This application Mar. 17, 1971, Ser. No. 125,077
Int. Cl. B25c *1/04*; F15b *13/04*
U.S. Cl. 91—410 6 Claims

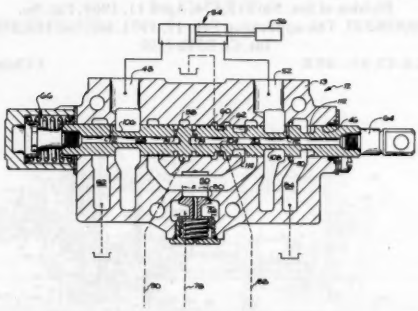


A surgical instrument for applying sterilized staples from a disposable staple-carrying cartridge to the disunited skin of a patient in order to effect a joining of the skin. The instrument consists of an anvil adapted to lie flush with the skin, a disposable cartridge housing a plurality of staples which are to be folded around the anvil, and a pusher for bending the staples around the anvil. The pusher is U-shaped with chamfers on the arms thereof to effect the bending with a minimum of force. A gas-powered unit serves to eject and form the staples in a neat and uniform manner. A novel disposable gas cartridge is also disclosed.

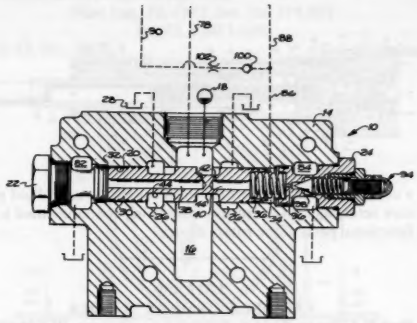
3,815,477
CONTROL VALVE INSTRUMENTALITY

Roger H. Ailshie, Lewis, Kans.; Kenneth G. McMillen, deceased, late of New Castle, Ind., and Leanne S. McMillen, administrator, Fort Wayne, Ind., assignors to Cross Manufacturing Inc., Lewis, Kans.

Filed Feb. 6, 1973, Ser. No. 329,963
Int. Cl. F15b *11/16*
U.S. Cl. 91—411 R 15 Claims



An open center directional control valve assembly having an unloading valve that diverts inlet flow to drain without passing through the entire assembly whenever all control valves are in neutral. When one or more of the control valves are operative, to actuate their associated motors at desired speeds, the unloading valve is automatically positioned by the pressure difference between inlet pressure and the highest motor pressure to deliver the necessary flow to operate the

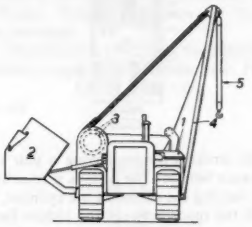


motors at the desired speeds while diverting the remainder of inlet flow to drain.

3,815,478
PIPELAYER HYDRAULIC DRAWWORKS WITH FREE-FALL

Evald Gustav Axelsson, Stafford, and David Collier, Brewood, both of England, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 29, 1970, Ser. No. 84,978
Claims priority, application Great Britain, June 26, 1970, 31078/70
Int. Cl. F01b *13/06*
U.S. Cl. 91—497 13 Claims



In cable winding gear driven by a hydraulic motor of the kind having radial pistons driving a surrounding cam ring, a control is provided for applying differential pressure to the motor pistons so that they are disengaged from the cam ring which can then rotate freely. This provision enables the cable to be run out freely, so that, for example, in a crane free fall of the load can be allowed while avoiding damage to the motor. Pipe-laying equipment including the free-fall provision is described.

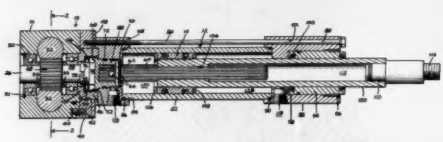
3,815,479
COMPOUND MOTION FLUID ACTUATOR

Richard L. Thompson, Fort Wayne, Ind., assignor to PHD, Inc., Fort Wayne, Ind.

Filed Jan. 20, 1972, Ser. No. 219,233
Int. Cl. F01b *21/00*, *9/00*, *31/10*
U.S. Cl. 92—2 9 Claims

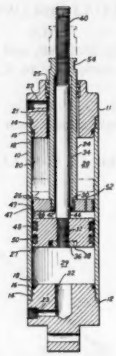
The invention is a compound motion fluid actuator for producing simultaneously or separately both reciprocating and turning motions. The actuator includes a fluid-pressure operated rotary power device coupled to a reciprocable piston in a fluid-pressure power cylinder such that the piston rod

connected to the piston has imparted thereto the reciprocal motion of the piston as well as the rotary motion of the rotary device. The piston is coupled to the rotary device by means of



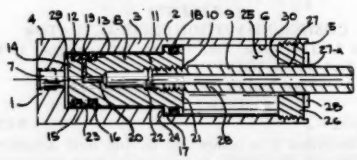
a coupling mechanism which prevents the force of fluid pressure acting against the piston from being communicated to the functional parts of the rotary device.

3,815,480
VARIABLE STROKE CYLINDER
Rudolf A. Spyra, 5344 N. Paulina Ave., Chicago, Ill. 60640
Filed Nov. 17, 1969, Ser. No. 877,257
Int. Cl. F01b *3/00*
U.S. Cl. 92—13.51 **5 Claims**



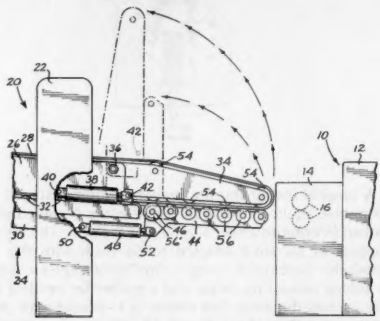
In a variable stroke cylinder having a pair of pistons in which the distance between the pistons is selectively variable for selectively varying the stroke of the cylinder, a vent communicates with the space between the pistons for venting the space when the distance between the pistons is being varied.

3,815,481
POWER CYLINDER WITH PISTON RETURN BY OWN VACUUM FORCE
Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130
Filed Apr. 14, 1972, Ser. No. 244,019
Int. Cl. F01b *3/00*; **F16j** *1/00*
U.S. Cl. 92—86 **7 Claims**



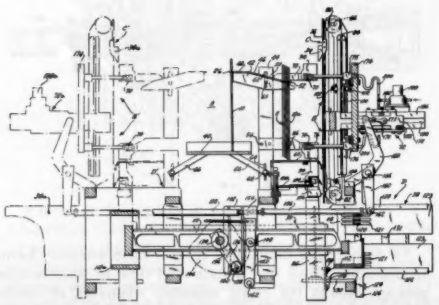
A power cylinder converting pressure energy into linear motion and more particularly to a power cylinder having cylinder and piston of differential diameters and designed so as to create vacuum force by the piston forward motion inside a cylinder subjected to pressurized fluid to extend a piston rod attached thereto and to perform work, said vacuum force large enough to return piston and rod assembly back into the original first retracted position without the use of springs and capable of operating as a double acting cylinder controlled by a simple 3-way valve of solenoid or manual type.

3,815,482
ARTICULATED CONVEYOR
Victor R. Nelson, 2700 S.W. Summit Dr., Lake Oswego, Oreg. 97034
Filed Oct. 19, 1972, Ser. No. 299,110
Int. Cl. B31b *1/04, 1/94*
U.S. Cl. 93—36 R **5 Claims**



Equipment for printing, slotting, folding and gluing paperboard container stock includes a printer-slotter unit and a folder-gluer unit. In order to integrate the units for in-line operation and make space available between them for manual adjustment of the slotter heads, an articulated conveyor is connected pivotally to each of the spaced stock conveyors of the folder-gluer unit, for lateral adjustment therewith and for pivotal adjustment between an operative position projecting toward the printer-clotter unit and a retracted position extending upwardly adjacent the folder-gluer unit.

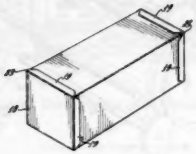
3,815,483
TRAY FORMING MACHINE
Carl P. Cato, Lynchburg, Va., assignor to Dacam Corporation, Lynchburg, Va.
Division of Ser. No. 815,474, April 11, 1969, Pat. No. 3,638,537. This application Feb. 17, 1971, Ser. No. 116,276
Int. Cl. B31b *1/30*
U.S. Cl. 93—49 R **3 Claims**



A box forming machine comprises a loading station at which a stack of blanks is stored, the blanks being moved from

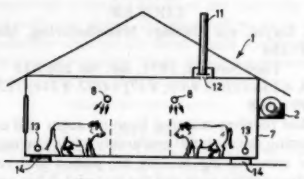
that stack to a conveyor, during which time a part of the blank is folded. The blank, thus folded, is then positively delivered to a station where additional operations are performed.

3,815,484
METHOD FOR FORMING CARTON
Charles Wright Jones, Los Angeles, Calif., assignor to Xepex Industries, Inc., Beverly Hills, Calif.
Division of Ser. No. 139,502, May 3, 1971, Pat. No. 3,749,300. This application Feb. 14, 1973, Ser. No. 332,426
Int. Cl. B31b *49/02*
U.S. Cl. 93—49 M **8 Claims**



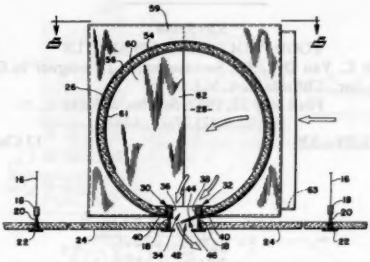
A one-piece blank which may be formed into a liquid-tight carton without the employment of a mandrel during the forming process is T-shaped and is comprised of side-wall panels integrally interconnected and numbering three or more to provide a carton of polygonal cross-section. One of the side wall panels has integrally connected carton end panels to be folded down upon and sealed to sealing flaps of the other side panels, after the side panels have been bent around into the configuration of an open ended tube and the ends of the blank thus brought together and adhesively interengaged to form a longitudinal seam. The end panels are also provided with sealing flaps which are folded down upon and sealed to the outside surfaces of the other side panels, thus providing internal and external liquid-tight seals.

3,815,485
METHOD AND DEVICE FOR VENTILATING A SPACE
Johannes Thedorus Antonius Beusink, Lichtenvoorde, and Bernard Joseph Buesink, Oerle, both of Netherlands, assignors to Integra Lichtenvoorde N.V. Netherlands
Filed Nov. 30, 1971, Ser. No. 203,270
Int. Cl. F24f *3/02*
U.S. Cl. 98—39 **2 Claims**



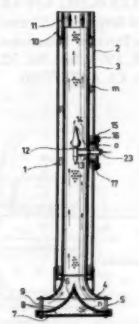
A method and device for ventilating a space containing living beings such as animals by supplying a gaseous fluid through a plurality of apertures at a high speed, thereby periodically interrupting the gas supply such that between two successive blowing periods, the gas stream is almost completely coming to a standstill.

3,815,486
AIR CIRCULATION DIFFUSER SYSTEM
Thompson Morrison, Shaker Heights, Ohio, assignor to NKM Corporation, Chagrin Falls, Ohio
Filed Aug. 10, 1972, Ser. No. 279,509
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D **15 Claims**



An air circulation diffuser system for use with a ceiling grid structure comprising an inverted channel whose free edges are shaped to conform to the upper edges of the ceiling grid structure for support thereby. An opening is provided in the ceiling between the grid structure for flow of air from the channel, and a baffle or vane is also supported by the grid structure and positioned in the opening for controlling the rate and direction of air flow from the channel.

3,815,487
PROCESS AND DEVICE FOR GASO-DYNAMIC VENTILATION
Constantin G. Teodorescu; Constantin Octavian Ceauselu, and Sorin Ioanitescu, all of Bucharest, Romania, assignors to Institutul Pentru Creatie Stiintifica Si Technica-Increst, Bucharest, Romania
Filed Oct. 12, 1972, Ser. No. 296,933
Claims priority, application Romania, Mar. 21, 1972, 70211
Int. Cl. F24f *7/06*
U.S. Cl. 98—43 **2 Claims**



The invention relates to a process and device for ventilation and air conditioning, which operate by steam or compressed air ejection. The process performs the entrainment and mixing of the air as a secondary fluid with the primary fluid by creating a depression in the primary fluid, introduced under pressure into an annular chamber; the primary fluid expands through an annular slot, between two axially confronting surfaces; due to the Coanda effect, the emergent flow adheres pellicularly to a closed surface with a curved profile, located downstream of the slot. The device includes a Coanda ejector

of the outer type fastened to a support; the device includes a cylindrical body in which the annular chamber is located. The cylindrical body is connected by a screw thread to the curved profile body of revolution; between the two bodies is arranged the adjustable slot. The ejector is disposed in a cylindrical tube with a layer of acoustic insulation having an air-inlet at the upstream end and obturation means with flaps at the downstream end from the ejector.

3,815,488

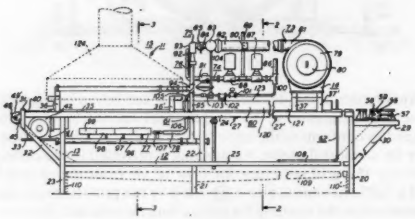
FOOD PROCESSING APPARATUS

Garritt C. Van Dyk, Jr., Succasunna, N.J., assignor to Con-Ray, Inc., Cliffside Park, N.J.

Filed May 22, 1972, Ser. No. 255,586

Int. Cl. A47j *27/14, 44/00*

U.S. Cl. 99—339 **13 Claims**



A food processing apparatus, for processing of consumable matter, such as steaming and broiling sausages in the manufacture of brown and serve sausages, which is provided with processing means which process the consumable matter continuously and uniformly, which is further provided with regulating means which regulate the flow of pressurized steam and steam vapor, to prevent the dispersal of the food products during steaming thereof, and which is further provided with directing means which direct the flow of the exhaust vapors and emissions.

3,815,489

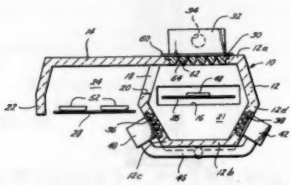
RADIANT COOKING APPARATUS

Edward A. Reid, Jr., and Stephen P. Cremean, both of Columbus, Ohio, assignors to Davmor Industries, Inc., Miami, Fla.

Filed Jan. 8, 1973, Ser. No. 322,020

Int. Cl. A47j *37/06*

U.S. Cl. 99—339 **9 Claims**



A elongate broiler is provided for simultaneously cooking meat patties and toasting buns, the broiler including coextensive passageways defined by insulated wall portions, conveyors located in each passageway, and burners of radiant tile form located in only one of the passageways. Burners are located on lower side walls, and upper wall, of one of the passageways.

3,815,490

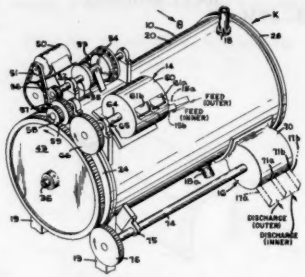
TWO LINE SINGLE PASS COOKER

Harry E. Barney, Jr., San Jose, and Rodney A. Engdahl, Campbell, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 25, 1972, Ser. No. 292,001

Int. Cl. A23l *3/06*

U.S. Cl. 99—365 **5 Claims**



The horizontal axis continuous rotary cooker of the type having an outer shell and an outer spiral, inner shell and inner spiral and a rotatable wheel between the spiral is designed to accommodate two separate lines or rows of containers, such as cans, for steam cooking, sterilizing or processing. Both rows of containers are fed separately into the outer shell and are discharged from the outer shell. In one of the embodiments the row of containers processed in the outer shell are fed directly into the reel whereas those that traverse the inner shell roll down a ramp past the end of the reel. At the discharge end for the containers the outer row is discharged from the outer shell, whereas the inner row of containers is transferred to the outer shell and is discharged alongside of the outer row. In another embodiment, containers destined for the inner shell are first fed to the outer shell and make a transfer pass in the opposite direction from the major pass along the outer shell, whereupon this row of containers is fed to the inner shell. In another embodiment the inner shell is separately rotated at a differential speed relative to the reel, to vary the processing time for the containers on the inner shell as compared to those on the outer shell.

3,815,491

COOKER

Elbert J. Guyer, c/o Moridge Manufacturing, Moundridge, Kans. 67354

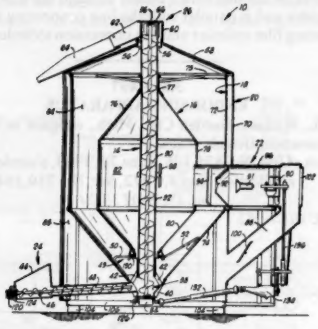
Filed Nov. 22, 1971, Ser. No. 200,822

Int. Cl. A23n *15/00, 9/00;* **F47j** *44/02;* **F24c** *3/12, 15/20*

U.S. Cl. 99—468 **5 Claims**

A cooker receives material from an auger and cooks same by circulating the material preferably while stirring same in a cavity or zone having heating air passed and recirculated through the cooking zone and the material. It has an inner perforated vessel surrounded by a second perforated vessel spaced from an outer imperforate vessel. An auger moves the material in a vertical fashion through the inner vessel and disperses and circulates same through the cooking zone between the inner vessel and the second vessel and is used to remove grain from the cooker. Heat is supplied to fresh air and preferably recirculating air from between the second vessel and the outer vessel, and the resulting heated air is forced

into the inner vessel. It then passes outwardly through the inner perforate vessel and heats and cooks the material in the



cooking zone, and then passes out through the second perforated vessel.

3,815,492

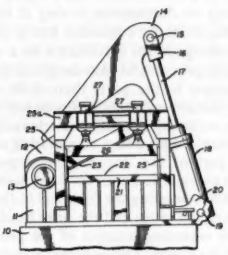
SHEAR AND HOLD DOWN DEVICE

Charles F. Simmers, Canfield, Ohio, assignor to Mayer Pollock Steel Corporation, Pottstown, Pa.

Filed Jan. 16, 1973, Ser. No. 324,229

Int. Cl. B30b *9/32*

U.S. Cl. 100—95 **7 Claims**



A shear and hold down device are arranged in side by side relation on a common base, the shear having a single alligator jaw and a hydraulic cylinder for actuating the same. The hold down device includes a frame spanning the area adjacent the shear and having a movable clamping bar positioned therein for movement by a pair of pivoted hydraulic piston and cylinder assemblies arranged to move the clamping bar into engagement with any object therebeneath so as to hold the same immediately adjacent the shear blade. Guide means on the opposite side of the shear blade prevent movement of the shear blade away from the hold down clamping bar.

3,815,493

METHOD AND APPARATUS FOR EMBOSSING TUBULAR ITEMS HAVING AN OPEN END

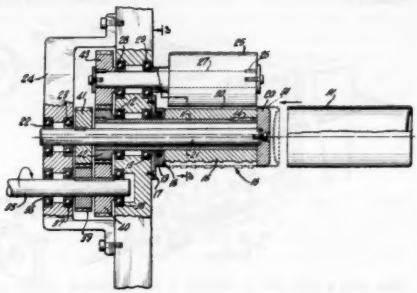
Frank W. Broderick, New Providence, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 2, 1972, Ser. No. 294,408

Int. Cl. B41f *17/20*; **B21d** *51/12*

U.S. Cl. 101—6 **9 Claims**

Apparatus for embossing to register previously printed tubular items having an open end using a pair of embossing rolls. One roll of the embossing set has a smaller diameter portion which is smaller than the diameter of the tubular item. The larger diameter portion of this roll operates in conjunction with the embossing portion and has the same or slightly smaller diameter than the inside diameter of the tubular object being embossed. The larger diameter portion drives the item



to be embossed at the same peripheral speed as the smaller diameter embossing portion. This roll operates in conjunction with the other embossing roll to form a complete unit which is a station designed to operate with high speed can making equipment.

3,815,494

APPARATUS FOR EMBOSSING MOVING WEBS

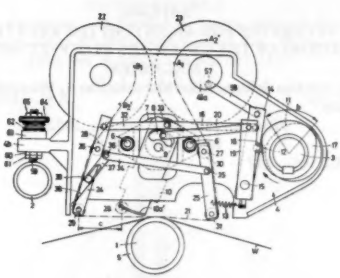
Karl Bahnmuller, Dietikon, Switzerland, assignor to MADAG Maschinen- und Apparatebau Dietikon AG, Zurich, Switzerland

Filed Jan. 19, 1973, Ser. No. 324,908

Claims priority, application Switzerland, Feb. 1, 1972, 1442/72

Int. Cl. B41f *19/02*, *33/36*; **B41j** *35/24*

U.S. Cl. 101—22 **9 Claims**

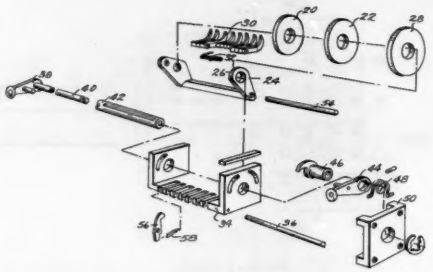


An apparatus for embossing the surface of a moving web at spaced intervals or embossing individual work pieces moving in succession past a work station and employing a heated embossing tool mounted for reciprocal motion and cooperated with a back-up roll during its work stroke to press a transfer web into contact with the work piece as it moves over the roll. The embossing tool is lifted clear of the web during the return stroke. The transfer web is advanced during the embossing operation at substantially the same rate as the moving web and retracted during the return stroke of the die at a reduced rate to effectively feed the web progressively through the apparatus and present a useable transfer surface at each work stroke.

3,815,495
MODULUS 10 NUMBERING MACHINE

Gilbert E. Strackbein, 96 Broadmoor Dr., Little Rock, Ark. 72204

Filed Mar. 9, 1973, Ser. No. 339,859
Int. Cl. B41l 45/00; G06f 11/00
U.S. Cl. 101—76 6 Claims

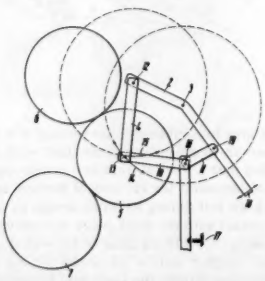


An improved numbering machine of the type having 5 or 10 conventional numbering heads mounted about a shaft coupled to a press or collator drive-train so that each of the heads is presented sequentially to provide a unique number for each of a number of sequentially presented documents or the like. Each of the heads has a first operating arm incrementing the number presented and riding in a groove of a first cam member having a portion actuating the first arms for each shaft rotation and a second operating arm incrementing or decrementing a parity digit presented by a parity digit wheel on each head. The second arms likewise ride in a groove of a second cam member having a plurality of solenoids each with a plunger member which can be moved into the groove to a position actuating the second arms so that the parity digit is incremented or decremented by one unit for each plunger in the groove. A further cam member rotates with the shaft and supplies signals to a counting and logic circuit which controls the solenoids to provide the correct modulus 10 parity coded digit.

3,815,496
APPARATUS FOR ADJUSTING THE RELATIVE POSITIONS OF THE CYLINDERS IN OFFSET PRINTING MACHINES

Hans Joachim Jahme, Eckernfordestrasse 1, Wiesbaden, Germany

Filed Nov. 10, 1972, Ser. No. 305,550
Int. Cl. B41f 13/14
U.S. Cl. 101—218 4 Claims

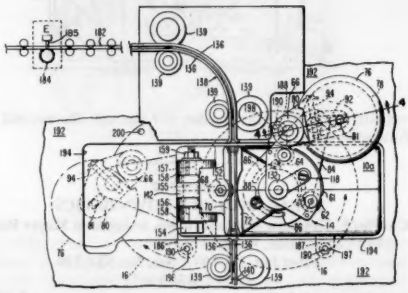


The bearings of the offset cylinder are mounted in a pair of link mechanisms each made up of four pivotally connected links and arranged so that the offset cylinder can be adjusted to be in constant rolling engagement with the printing film cylinder and the impression cylinder and also so that the axis of the offset cylinder can be displaced around a circle whose centre lies on the line which passes through the axis of the offset cylinder and is parallel with the line connecting the axes of the printing film cylinder and the impression cylinder.

3,815,497
ENDORSING APPARATUS

Harry L. Wallace, Garden City, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 835,145, June 20, 1969, abandoned. This application May 4, 1972, Ser. No. 250,384
Int. Cl. B41f 13/24
U.S. Cl. 101—232 8 Claims



This invention relates generally to printing apparatus and more particularly to a document or bank check endorser apparatus for printing on documents moving at high speeds in which the operating parts are combined into a self-contained, unitary assembly designed for installation as a unit in larger data processing equipment and also designed when installed for convenient access to the parts thereof for maintenance purposes. The document endorser comprises a self-contained printing assembly including a print head releasably secured to one end of a rotatable shaft and a cooperating chute gate assembly forming part of the document transport path, and further comprises an electric motor for continuously driving a fly wheel, a clutch for coupling the fly wheel to the shaft for intermittently rotating the latter and the print head, and a brake device for quickly retarding rotation of the print head upon disengagement of the clutch. The endorser is installed as a unit in supporting structure preferably with the shaft in vertical position and the print head at the upper end thereof in accessible detachable position for printing on documents successively fed thereby. Included in the chute gate assembly is an impression roller or platen capable of fine adjustment for equalizing the printing pressure on the documents fed thereby. Both the cabinet and the endorser unit are cooperatively designed so that the latter may be installed in either of two positions on opposite sides of the document transport path such that with slight modification of the unit for either position it is capable of printing on the front or the reverse sides of documents conveyed along the path.

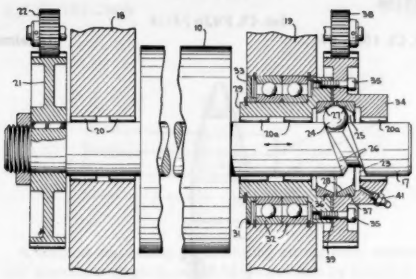
3,815,498
OSCILLATING ROLL FOR PRINTING PRESSES

Jimmie A. Harrod, Durham, N.H., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 128,508, March 26, 1971, abandoned, which is a division of Ser. No. 885,748, Dec. 17, 1969, Pat. No. 3,651,758. This application June 11, 1973, Ser. No. 368,624
Int. Cl. B41f 31/14
U.S. Cl. 101—348 3 Claims

In an ink train of printing press rolls, means for oscillating the central distribution roll thereof along its rotation axis in-

cludes an offset groove defining an inner race on the central roll axle, ring means having an annular groove therein defining an outer race and facing the offset groove, the ring means being mounted for rotation about the central roll axle, a ball member located between the inner and outer races, means



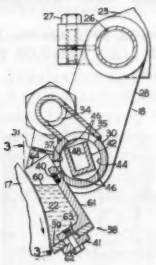
rotating the ring means at a first rate of rotation and means rotating the central roll axle at a second rate of rotation different from the first rotational rate whereby the central roll is oscillated along its rotation axis within a wide range of oscillation ratios as the ball member both rotates and revolves about the central roll axle.

3,815,499

INK APPLICATOR MEANS FOR DOWNSIDE SURFACE OF PRINTING PRESS ROLL

Norman C. Abler, Menomonee Falls, Wis., assignor to Faustel, Inc., Butler, Wis.

Filed May 26, 1972, Ser. No. 257,164
Int. Cl. B41f *31/02*
U.S. Cl. 101—364 **3 Claims**



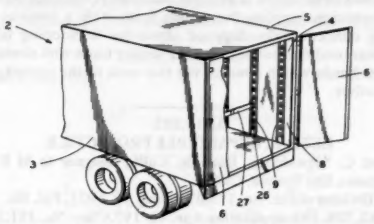
Ink applicator means for applying liquid ink to the downside surface of a printing press roll comprises a hollow ink applicator tube adjacent the downside surface of the roll. The tube has a longitudinal ink outlet slit in one side thereof facing the roll. Elongated ink guide means are provided on the tube below the slit for defining an ink reservoir bounded on one side by a portion of the surface of the roll. The elongated ink guide means have a lower edge adjacent but spaced from the surface of the roll. The ink reservoir assures application of an even, unbroken layer of ink on the roll surface.

3,815,500

FREIGHT BRACING APPARATUS FOR A FREIGHT CONTAINER AND METHOD FOR ASSEMBLING SAME

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 7, 1973, Ser. No. 358,25
Int. Cl. B61d *45/00*
U.S. Cl. 105—369 A **6 Claims**



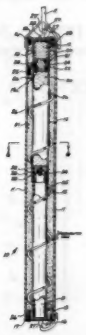
In a freight container for a vehicle or the like a side wall construction for lading control including a side wall of plywood core overlaid with fiberglass reinforced polyester skin, a plurality of upright lading bracing attachment structures each including an upright panel punched with a pattern of logistic slots being slid lengthwise into an upright retainer, said logistic slots being spaced from one another vertically and access holes being punched in the panel between the logistic slots, each hole permitting lock bolts extending from the outside through the holes to have nuts or other fastening means put on the lock bolts, thereby clamping the retainer and the panel tightly to the side wall. The panel may be made slightly less in length than the retainer, then the lock bolt hole may be drilled through the side wall and the retainer in line with respective logistic slots, then the lock nuts may be placed on the bolts through the logistic slots and then the panel may be shifted to hide the nuts therebehind and to allow for coupling of lading strap to the logistic slot without interference from the nut and bolt arrangement.

3,815,501

APPARATUS FOR COMPACTING MATTER WITHIN A CONFINED AREA

Ralph B. Anderson, and Ronald E. Nelson, both of Houston, Tex., assignors to All-Ways Safe Systems, Inc., Houston, Tex.

Filed Dec. 8, 1972, Ser. No. 313,260
Int. Cl. F42b *3/00*
U.S. Cl. 102—24 R **26 Claims**



A self compacting explosive cartridge for use in bore-holes. The cartridge is formed from rigid, upper and lower telescoping tubes which extend centrally through a larger diameter sleeve of flexible material. Prilled ammonium nitrate fills the annular space between the tubes and the sleeve; the upper

tube is filled with diesel fuel and the lower tube contains a detonator. When remotely activated by a signal, compressive means included in the cartridge telescope the tubes together which foreshortens the cartridge and displaces the fuel from the upper tube into the ammonium nitrate causing the two chemicals to combine to form an explosive mixture. The foreshortening or setting of the apparatus compacts the explosive material in the bore-hole. The preferred form of the invention obtains the force for setting the cartridge from a stretched outer sleeve of resilient material. A modified form of the invention supplies the setting force with a tension coil spring concentrically disposed about the telescoping tubes. Another modification supplies the setting force with stretched rubber bands which connect the two ends of the cartridge to each other.

3,815,502

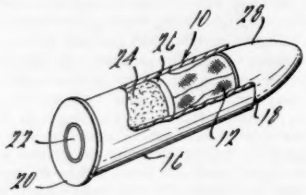
LETHAL EXPANDIBLE PROJECTILE

Robert C. Mawhinney, Danville, Calif., assignor to M B Associates, San Ramon, Calif.

Division of Ser. No. 173,079, Aug. 19, 1971, Pat. No. 3,762,329. This application Apr. 16, 1973, Ser. No. 351,525

Int. Cl. F42b *7/02, 13/16*

U.S. Cl. 102—42 C **9 Claims**



A high penetration, short range projectile comprised of a shot filled, deformable, flexible bag which is initially folded or rolled for insertion in a conventional cartridge case of a small firearm or the like, and adapted to be launched therefrom. Upon exit from the muzzle of the small arm, the bag radially expands under the influence of centrifugal force provided by the rifling grooves within the barrel to provide a spin stabilized trajectory characterized by a substantial energy decay in a relatively short, preselected down range distance.

3,815,503

SELF-PROPELLING BALLISTIC PROJECTILES

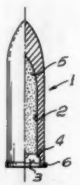
Osvaldo Cesar Infantino, Buenos Aires, Argentina, assignor to Direccion General de Investigacion y Desarrollo (DIGID) Ministry of Defense of the Argentine Republic, Buenos Aires, Argentina

Filed Oct. 18, 1971, Ser. No. 189,905

Claims priority, application Argentina, Oct. 19, 1970, 231877

Int. Cl. F42b *15/10*

U.S. Cl. 102—49.3 **4 Claims**



Ballistic projectiles for firearms and more particularly to a self-propelling ballistic projectile which, upon firing, is totally expelled from the firearm without leaving a residual case therein.

3,815,504

METHOD OF MAKING SPLINTER SHELLS, AND SPLINTER PROJECTILES AND SPLINTER HEADS MADE ACCORDING TO THIS METHOD

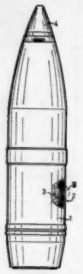
Heinz Tieben, Lauf, Germany, assignor to Diehl, Nurnberg, Germany

Filed June 12, 1972, Ser. No. 261,817

Claims priority, application Germany, June 12, 1971, 2129196

Int. Cl. F42b *13/18*

U.S. Cl. 102—67 **3 Claims**



A splinter shell and method of making same according to which at least two tubular bodies of strong but deformable material are coaxially arranged with regard to each other and located one within the other while being peripherally spaced from each other by the diameter of the desired splinter bodies to be incorporated in the shell, whereupon the splinter bodies are introduced between the tubular bodies and, while the outermost tubular body is confined on its outside, the inner peripheral surface of the innermost tubular body is subjected to radially outwardly directed pressure to cause all of the tubular bodies to deform partially around the splinter bodies and to sandwich the same between the adjacent tubular bodies.

3,815,505

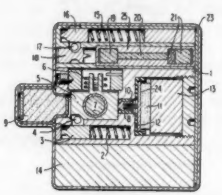
SELF-DESTRUCTING APPARATUS FOR IMPACT-DETONATING EXPLOSIVE DEVICES

Peter Roh, and Manfred Strunk, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Nov. 28, 1972, Ser. No. 310,092

Int. Cl. F42c *11/02*; **F22c** *9/00*; **F42c** *11/06*

U.S. Cl. 102—70.2 GA **14 Claims**



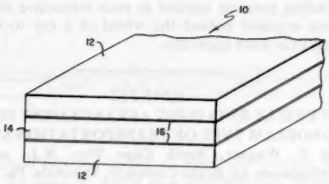
A self-destructing apparatus for impact-detonating explosive devices having a piezoelectric fuze responsive to sonic waves for detonation of the device. The apparatus includes means responsive to at least one of firing or dropping of the impact-detonating explosive device for triggering a sonic wave generator after a predetermined time delay, the sonic wave produced by the generator being transmitted to the piezoelectric fuze for detonation of the explosive device, thereby ensuring destruction of the device.

3,815,506

RUBBER CELLULOSIC TAPE SANDWICH INHIBITOR

Thomas W. Tamulevich, Worcester, Mass., and Ivan L. Tominack, Indian Head, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 16, 1972, Ser. No. 235,213
Int. Cl. F42b 1/00
U.S. Cl. 102—103 5 Claims



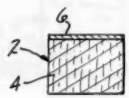
A method and article for inhibiting nitrate ester migration and plasticizer migration in solid propellants by encasing the solid propellant fuel grain in a laminated wrap material having a layer of silicone rubber sandwiched between layers of cellulosic material such as ethyl cellulose.

3,815,507

ELECTRICAL INITIATOR

Charles G. Irish, Jr., Cheshire; Joseph W. Silva, Northford, and Raymond I. Cowles, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 4,480, Jan. 21, 1970, abandoned.
This application Sept. 5, 1972, Ser. No. 286,384
Int. Cl. F42b 1/00
U.S. Cl. 102—103 8 Claims



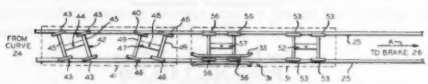
An initiator having a body of nitrocellulose material having a surface characterized by thin fibres or thin webs with a film of a conductive material adhered to said surface.

3,815,508

METHOD AND APPARATUS FOR IMPROVING CAR ROLLABILITY IN A RAILROAD CLASSIFICATION YARD

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,496
Int. Cl. B61b 1/00
U.S. Cl. 104—26 R 8 Claims



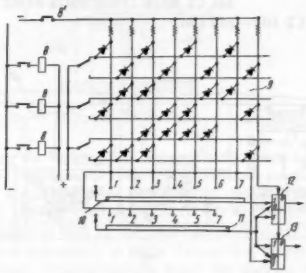
A method and apparatus for improving the rollability of railroad cars moving into a classification yard or into the straight storage sections of the classification tracks of a classification yard; at least two wheels on each truck of each car are engaged by a guide rail which may be a part of a small retarder and which extends parallel to the track. The guide rail forces the wheels, and hence the truck, into alignment with the track. As applied to storage tracks, the track is preferably inclined, through the length encompassing the guide rail, at an angle sufficient to compensate for any loss of kinetic energy due to the limited braking effect of the guide rail.

3,815,509

APPARATUS FOR THE AUTOMATIC CONTROL OF A MONORAIL ROAD

Mjud Izrailevich Voronin, ulitsa Udaltsova, 16, kv. 138; Gennady Petrovich Gnusarev, ulitsa Flotskaya, 56, korp. 1, kv. 103; Abram Grigorievich Mekler, ulitsa Nagornaya, 45b, korp. 25, kv. 70, and Viktor Ivanovich Sosedov, ulitsa Nagornaya, 19, korp. 24, kv. 5, all of Moscow, U.S.S.R.

Continuation-in-part of Ser. No. 202,909, Nov. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 838,918, July 3, 1969, abandoned. This application May 26, 1972, Ser. No. 257,401
Int. Cl. B61l 11/08
U.S. Cl. 104—88 2 Claims



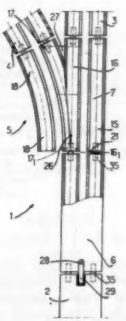
An apparatus for the automatic control of a monorail road having a plurality of movable objects and switches for changing tracks, in which set-up units are located at each of the destination points and before each of the switches for changing tracks to record information which is read out by sensors and converted from one code into another with the help of a decoder whose outputs are connected, via switches, to logical elements issuing signals to stop the movable objects and to switch the means for changing tracks.

3,815,510

MONORAIL POINTS

Jean-Louis Tourtellier, Mulhouse, France, assignor to Tourtellier S.A., Mulhouse, France

Filed July 26, 1972, Ser. No. 275,181
Claims priority, application France, Oct. 12, 1971, 71.37032
Int. Cl. E01b 25/22
U.S. Cl. 104—104 9 Claims



A monorail point or deflecting device comprising a simple- or double-throw point and a pivoting tongue or blade, characterized in that it comprises a welded assembly consisting of a standard straight section member having two rolling tracks

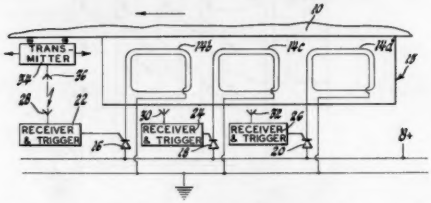
and of at least one standard other in order to juxtapose, in the case of a simple point, one portion of one of the two rolling tracks of said curved section member and one portion of one of the two rolling tracks of said straight section member in order to reduce the number of rolling tracks at the blade point from four to three.

3,815,511

DC MAGNETIC PROPULSION AND LEVITATION SYSTEM FOR HIGH SPEED VEHICLES

John K. Dukowicz, Southfield; Lyle O. Hoppie, Birmingham, and Tsih C. Wang, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 26, 1973, Ser. No. 354,700
Int. Cl. B61b *13/08*; **H02k** *41/02*
U.S. Cl. 104—148 LM **3 Claims**



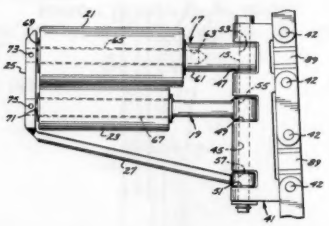
A magnetic propulsion and levitation system for a vehicle which is adapted to travel over an established roadbed. The system includes one or more superconducting magnets carried by the vehicle and a plurality of coils embedded in the roadbed in the path of travel of the vehicle. The coils are sequentially energized at a predetermined position relative to the superconducting magnet for establishing levitation and propulsion forces. The energization of the coils is accomplished by SCR switching elements which are switched on in response to a signal radiated from the vehicle and are switched off by the counter EMF induced in the coils when the superconducting magnet leaves the vicinity of the coil.

3,815,512

ON DEMAND CAR WASH CONVEYOR APPARATUS

Adam Balas, Los Angeles, Calif., assignor to The Allen Group Inc., Melville, Long Island, N.Y.

Filed Apr. 6, 1972, Ser. No. 241,738
Int. Cl. B65g *17/24*
U.S. Cl. 104—172 B **7 Claims**



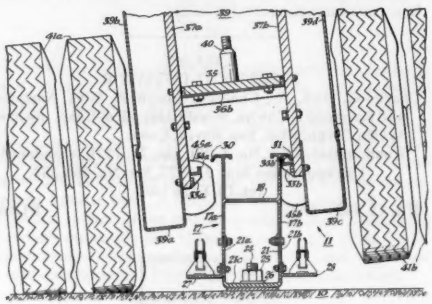
On demand car wash conveyor apparatus for installation in a tire path of a car to be washed and having a retraction trench extending therealong. The conveyor apparatus includes an endless chain extending along the tire path adjacent such trench and has a plurality of longitudinal mounting pin means spaced longitudinally therealong. A plurality of sets of first and second shafts are pivotally mounted on their respective one extremities from the respective pin means and are pivotable between an operative position projecting transversely over the tire path and a retracted position extending vertically into the retraction trench. A plurality of sets of pusher and support rollers are mounted from the respective first and second shafts and the pusher rollers are disposed above the level of the support rollers when the shafts are in their operative positions. Further, a plurality of strut means are pivotally connected on their respective one extremities with the respective pin means and project forwardly and outwardly therefrom to have their respective opposite extremities connected with the free ends of the respective first shafts to thereby provide support against the bending moment applied to such respective shafts when they are engaged behind the wheel of a car to be pushed through a car wash apparatus.

3,815,513

VEHICLE RETAINING ARRANGEMENT FOR A MONOBEAM TYPE OF TRANSPORTATION SYSTEM

Joseph F. Wagner, North Cape May, N.J., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Oct. 6, 1972, Ser. No. 295,760
Int. Cl. B61k *5/00*
U.S. Cl. 104—248 **5 Claims**



This disclosure relates to a vehicle entrapping or retaining arrangement for a monobeam type of transportation system. The system includes an elongated roadway having a pair of horizontal surfaces straddled by a central H-shaped guide beam. The monobeam vehicles include trucks which have a plurality of supporting wheels which run on the horizontal surfaces of the roadway as well as a plurality of guide wheels which follow vertical sides of the H-shaped central guide beam. A pair of inverted furrows are formed along the upper edge of each of the vertical sides and extend the length of the central guide beam. The inverted furrows are adapted to be engaged by matching lip portions carried on the sides of the trucks so that the monobeam vehicles cannot be overturned by high velocity winds or centrifugal forces experienced in the negotiation of curves and bends in the roadway.

ERRATUM

For Class 105—369 see:
Patent No. 3,815,500

3,815,514

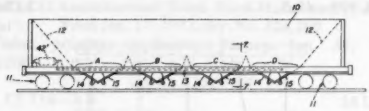
RAPID DISCHARGING HOPPER CAR DOOR ACTUATING MECHANISM

James C. Heap, Munster, Ind., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Oct. 16, 1972, Ser. No. 297,788
Int. Cl. B61d *7/04, 7/18, 7/28*
U.S. Cl. 105—240 **22 Claims**

A mechanism for opening and closing a horizontally hinged door, such as on railroad hopper cars and trucks, having a tie-

rod actuating means adapted to be rotatably mounted to a container, a tie-rod pivotally and slidably joined at a first end to the tie-rod actuating means and joinable at the second end to the door on the container, the first end of the tie-rod being slidable in and between ends of an arcuate sector guide path in the tie-rod actuating means, means at one end of the guide path being capable of limiting downward displacement of the tie-rod when the door is open and said same means at the guide path end upon rotation of the tie-rod actuating means in



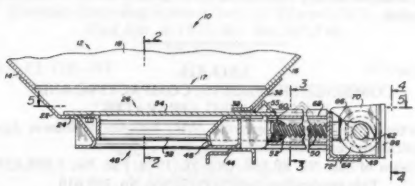
one direction lifts the tie-rod to maximum position thereby rotating the door to which it is attached into closing and locking position, and means at the other end of the guide path which, upon rotation of the tie-rod actuating means in the opposite direction through an angle defined by the length of the arcuate sector guide path and with the tie-rod stationary, forces and frees the first end of the tie-rod from maximum lifted and locked position to fall unrestrainedly downwardly through the arcuate guide path thereby permitting the door to which it is attached to rotate open rapidly by gravity.

3,815,515

SCREW ACTUATED HOPPER GATE

Irving D. Ross, Jr., Barrington, Ill., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Aug. 14, 1972, Ser. No. 280,581
Int. Cl. B61d *7/02, 7/20, 7/26*
U.S. Cl. 105—282 R **10 Claims**



A screw actuated hopper gate assembly is provided for use on gravity discharge railroad hopper cars. The assembly includes a hopper, a plurality of flanges which extend from the hopper to receive and support a movable gate, a plurality of frame members which assist in supporting the movable gate and give rigidity to the entire assembly, an axially fixed rotatable screw which is totally enclosed so as to prevent it from clogging during operation thereof, with the screw driving a nut fixedly attached to the gate for straight line forward and backward movement thereof, and a means for causing the screw to rotate.

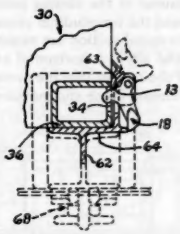
3,815,516

CONTAINER LOCK

Robert R. Girard, Saint Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,456
Int. Cl. B65j *1/22*; **B61d** *45/00*
U.S. Cl. 105—366 C **16 Claims**

A container locking device is disclosed for locking containers in place in transportation vehicles comprising a weighted base portion and a generally vertically extending web portion extending from the base portion. The web portion has a generally horizontally extending locking arm and above the locking arm means for pivotally mounting the locking device on a transportation vehicle, for example, one or more openings extending all or part way through the web portion. The locking device cooperates with a container whose lower portion has a mounting opening therein. As the container descends toward locking position in the vehicle, the lower portion of the container cams the locking arm about the pivot mounting means until the locking opening in the container is



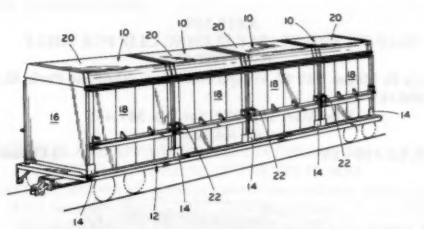
reached, when the locking arm automatically snaps into the opening. The containers are removed by manually rotating the locking arm about the pivot point to an elevated position which allows unobstructed removal of the containers. The lock is contoured so that an operator can easily determine if the locking arm is properly in place. Means may be provided on the container to automatically move the locking device from the elevated position to the locking position.

3,815,517

AUTOMOBILE CONTAINER

Phillip G. Przybylinski, Schereville, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 389,912
Int. Cl. B60p *7/08*
U.S. Cl. 105—368 R **11 Claims**



A three tiered automobile carrying container is provided comprising a soft skeletonized frame construction fitted within and about a series of interconnected sheet assemblies forming continuous longitudinally extending torsion tubes extending from the end wall to the open end of the container. The soft frame permits deflection of the frame unit to thereby utilize the torsion resisting characteristics of the interconnected wall sheet and deck sheet members.

3,815,518

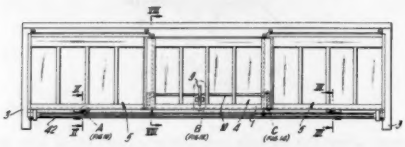
SIDE WALL PARTICULARLY FOR RAILROAD FREIGHT CARS

Felix Schneider, Netphen-Eckmannshausen, and Gerhard Kampmann, Netphen-Dreis-Tiefenbach, both of Germany, assignors to Waggon Union GmbH, Siegen, Germany

Filed Apr. 23, 1973, Ser. No. 353,402
Int. Cl. B61d *19/00*
U.S. Cl. 105—378 **10 Claims**

The side wall includes a frame and three sliding wall sections arranged in a common plane when closed and being dis-

placeable one over the other by rollers running in rails. The central section has lower runners moving on a runway rail and upper runners perpendicularly thereabove running in a guide rail, and each outer section has a lower roller between its center and its outer end running on a runway rail and a lower runner at its outer end bearing under the runway rail, each outer section having upper guide rollers running in a guide rail. The common runway and guide rails for the outer sections have, at those points which the runners and rollers engaged therewith assume in the closing position of the outer section, bends toward the longitudinal center line of the car. The runners of the central section are mounted on bell crank rocking levers pivotal about a horizontal axis parallel to the longitudinal axis of the car, so that the central section can be swung out of the common plane and moved over an outer section to open the side wall. The runway rails for the central and outer sections are constituted by a single rail section mounted in only two longitudinally spaced brackets on the lower chord of the frame, and this section is secured fixedly to one bracket while being longitudinally slidable in the other bracket. Guide fingers at the top of each outer section cooperate with catch hooks on the upper chord of the frame and which guide each outer section into the closed position, and support means on the lower chord engage the sections in the closed position to relieve the load on the supporting runners. Clamping means are provided to clamp each section in closed position to the upper and lower chords of the frame, and each outer section, with the central section swung out and displaced over the other outer section, is displaceable longitudinally to a position laterally between the central and the other outer wall sections.



3,815,519

SNAP-ON ADJUSTABLE SLIDING CLIP FOR SHELF PARTITIONS

Alvin H. Meyer, 941 W. Wrightwood Ave., Highland Park, Ill. 60614

Filed Mar. 15, 1973, Ser. No. 341,455
Int. Cl. A47b *57/00*
U.S. Cl. 108—61 **3 Claims**

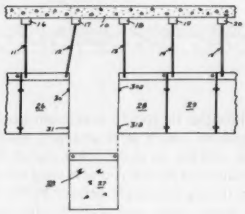
A shelf rail afixed to the front of gondola shelves and provided with slidably supported spring clips, said spring clips slidably inserted in flexible divider rails to hold them at right angles to the shelve rails and stiff grocery divider partitions that are attachable to any one of the divider rails to be adjustably positioned to any desired position to divide one product on a shelf from the next product. Said divider rails being flexible and permitting the divider rail to extend over shelves of differing width.

3,815,520

SHOOTING RANGE CEILING PROTECTION DEVICE

Joseph Nikoden, Jr., Inverness, Ill., assignor to Detroit Bullet Trap Corp., Schaumberg, Ill.

Filed Dec. 21, 1971, Ser. No. 210,359
Int. Cl. E06b *9/00*
U.S. Cl. 109—49.5 **2 Claims**



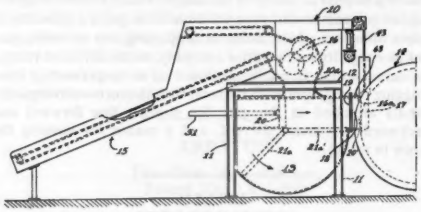
A ceiling protection device for a shooting range which includes a plurality of rectangular ceiling modules locked together at the sides and being suspended at the top and bottom edges. Each one of the modules has two positions for being hooked by a suspension chain. Normally only one chain is coupled to one of the hooks, leaving the other hook unused. When it is desired to remove and replace one of the modules due to excessive damage, the chain is merely unhooked from its normal position and connected to an adjacent hook means of another module. Once this is accomplished the module which is being replaced is free to be readily disconnected from the remaining ceiling structure. When the module is replaced, the chain is merely restored to its original position in the new module.

3,815,521

COMBINED SHREDDING, COMPACTING AND INCINERATING APPARATUS

Martin H. Panning, Thiensville, Wis., assignor to Blower Application Company, Milwaukee, Wis.

Division of Ser. No. 80,058, Oct. 12, 1970, Pat. No. 3,685,437. This application July 7, 1972, Ser. No. 269,610
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **6 Claims**



An assembly of a shredder, compactor and incinerator for receiving loose material, i.e. paper and the like, shredding it into small pieces, then compacting accumulated pieces into a bale-like form for delivery to an incinerator. A compacting wall moves against shredded material in an enlarged space and forces it toward an outer wall which defines, with the compacting wall and side walls, a bale-like form whereupon a ram moves the compacted material through an opening in an incinerator. The incinerator includes an inlet fire door which

upon closure thereof wipes the material clean from the face of the ram. The system includes automatic means for closing an inlet to the compacting device, compacting the material, ejecting the material into the incinerator, and operating the door for the inlet into the incinerator.

3,815,522

PROCESS AND APPARATUS FOR SIMULTANEOUSLY INCINERATING COMBUSTIBLE WASTE AND SLUDGE

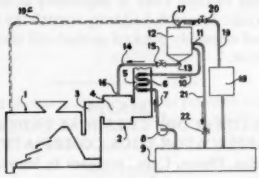
Dominique Marie Larger, Pont-A-Mousson, France, assignor to Eau Et Assainissement Socea, Rueil-Malmaison, France

Filed Jan. 17, 1973, Ser. No. 324,260

Claims priority, application France, Jan. 31, 1972, 72.03087

Int. Cl. F23g *5/04*

U.S. Cl. 110—8 R **14 Claims**



The sludge is first heated by heat exchange with the fumes of combustion from the combustible waste incinerating furnace. The sludge is then allowed to bake and water is separated from the sludge so as to obtain a residue. The residue is then incinerated and the water separated out is discharged.

3,815,523

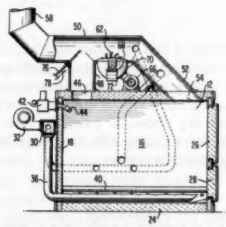
INCINERATOR

Robert E. Gibeault, South Glens Falls, N.Y., assignor to Kleenaire Recycling Systems, Inc., Ft. Edward, N.Y.

Filed Apr. 4, 1973, Ser. No. 347,740

Int. Cl. F23g

U.S. Cl. 110—8 C **10 Claims**



An incinerator having a closed combustion chamber includes an exhaust gas separator for separating and directing the lighter inert exhaust gases into a stack and the heavier exhaust gases, including smoke and other solid materials, into a recirculation system for recirculation through the combustion chamber. Air required to support combustion is admitted into the recirculation system and mixed with and heated by the exhaust gases being recirculated before entering the combustion chamber, thereby permitting the temperature in the combustion chamber to increase to a level sufficient to assure complete burning of the combustible materials in the exhaust gases recirculated into the combustion chamber and to normally sustain combustion without auxiliary burners except during the beginning and end portions of a burning cycle. The exhaust gas velocity is reduced in the gas separator to facilitate separation and recirculation of the heavier exhaust gases and solids.

3,815,524

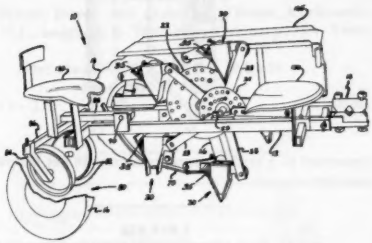
MULCH POT PLANTER

Benjamin Poll, 465 Brecado, Holland, Mich. 49423

Filed Aug. 11, 1971, Ser. No. 170,853

Int. Cl. A01c *1/00*

U.S. Cl. 111—2 **26 Claims**



A machine for planting organic matter through plastic sheeting laid over bare earth. The planting machine comprises a series of buckets which hold the organic matter, form openings in the earth and deposit the organic matter in the openings and are pivotally mounted on two horizontally offset bucket support wheels which maintain the buckets in an erect vertical position at all times. The bucket support wheels are in turn mounted on a generally horizontal frame supported by two wheels and tires for movement over the surface of the earth and include positive drive means to rotate said bucket support wheels and buckets at a constant rotational speed. One of two alternative packing means is incorporated in the machine to secure the deposited matter in the earth. Camming means are included to open the buckets at a predetermined position and to raise one of the alternative packing means over the deposited matter.

3,815,525

METHOD AND APPARATUS FOR INTRODUCING LIQUID INTO ROOT ZONE OF PLANTS IN SOIL

Anatoly Yakovlevich Kainson, novo-Alexeevskaya ulitsa, 3a; Jury Sergeevich Razygraev, ulitsa Elninskaya, 17, kv. 50; Nikolai Elizarovich Sorokin, ulitsa Mnevniki, 12, korpus 1, kv. 6; Sergei Alexandrovich Dobrokhotov, ulitsa Chernyshevskogo, 37, kv. 56; Veniamin Prokofievich Sokolov, Begovaya Alleya, 5, kv. 51; Nikolai Ivanovich Zaitsev, 2 Setunsky proezd, 4, kv. 52; Boris Genikhovich Zandman, Zelenogradskaya ulitsa, 21, korpus 1, kv. 107; Boris Peisakhovich Telyatnikov, Leningradskoe Shosse, 56, kv. 15; Nikolai Dmitrievich Kholin, ulitsa Krasnaya Prusnya, 9, kv. 66, all of Moscow, and Alexei Nikolaevich Ryazanov, ulitsa Liteinaya, 48, kv. 8, Klin, all of U.S.S.R.

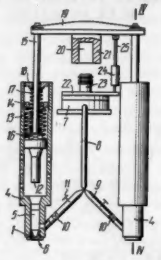
Continuation-in-part of Ser. No. 203,500, Nov. 30, 1971, abandoned, which is a continuation of Ser. No. 849,452, Aug. 12, 1969, abandoned. This application Oct. 5, 1972, Ser. No. 295,110

Int. Cl. A01c *23/02*

U.S. Cl. 111—6 **4 Claims**

Liquid under high pressure is injected into the root zone of plants in soil by the action of accumulated impact energy in the form of continuous pulse jets. A device for effecting injection of liquid comprises a chamber adapted to accumulated the liquid, and a nozzle disposed in the lower portion of the chamber and adapted to discharge liquid as pulse jets. A

plunger is accommodated in the chamber, the plunger being reciprocated to transmit an impact to the liquid and being



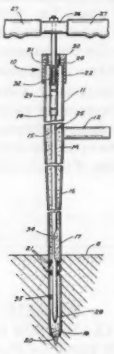
connected to a resilient compression member adapted to accumulate energy.

3,815,526

TOOL FOR DEPOSITING RODENT POISON UNDERGROUND

Levon Christopherson, Minneapolis, Minn., assignor to Diane Christopherson, Minneapolis, Minn.

Filed May 18, 1972, Ser. No. 254,731
Int. Cl. A01c *23/02*
U.S. Cl. 111—7.2 **1 Claim**



A tool for depositing a charge of granular material such as poison below the ground surface comprising an upright tubular barrel having an outlet opening at its bottom end, a valve rod extending axially through the barrel with its pointed lower end projecting through and closing the outlet opening, spring means acting between the barrel and rod to yieldably retain the rod in closed position in the outlet opening, handles on the barrel and rod to permit movement of the rod against the spring means to a position opening the outlet opening so that granular material may discharge from the barrel. The tool also has a valve means for limiting the amount of material that may be discharged each time the device is operated.

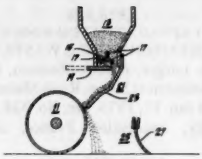
3,815,527

ROLLER, HOPPER, SCATTER SHIELD AND BRAKE ASSEMBLY FOR PRECISION SEEDING

John B. Dobbins, 9371 E. Chapman Ave., Garden Grove, Calif. 92641

Filed Sept. 5, 1972, Ser. No. 286,295
Int. Cl. A01c *7/08*
U.S. Cl. 111—11 **9 Claims**

A hopper for dispensing seed is connected to a roller for rolling and smoothly packing finely cultivated soil. A deflector plate having a step thereon is attached to the hopper for intercepting and scattering the seed dispensed from the hopper onto the back surface of the roller where the seed is further scattered uniformly over the roller and smoothly packed soil.



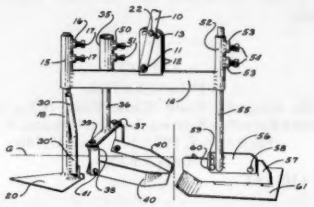
A rake having flexible tines is adjustably connected to the hopper and roller assembly to gently scratch the top surface of the rolled and smoothly packed seeded soil thereby securing the seed therein.

3,815,528

AGRICULTURAL DRY CHEMICAL UNDERGROUND APPLICATOR TOOL COMBINATION

Roy I. Hawkins, Pierce, Colo., assignor to Hawkins Mfg. Inc., Pierce, Colo.

Filed July 3, 1972, Ser. No. 268,638
Int. Cl. A01c *5/00*
U.S. Cl. 111—85 **4 Claims**



An Agricultural Tool and dry granular chemical Applicator Combination comprising a horizontally underground moveable ½ rhombus blade adapted on such movement for forming a momentary underground air-vacuum-like pocket for gravity receiving granular dry chemical particles into that vacuum-like pocket and for thereby effecting distribution of said chemicals throughout that pocket.

3,815,529

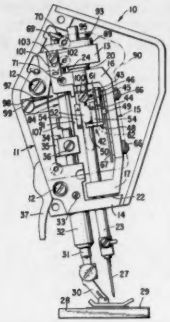
MANUAL NEEDLE ELEVATING DEVICE

Kenneth D. Adams, Madison, and John P. Brockman, Franklin Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 4, 1973, Ser. No. 347,983
Int. Cl. D05b *3/02, 55/16*
U.S. Cl. 112—158 R **4 Claims**

A mechanism in a zigzag sewing machine having a basting stitch device which operates by unlatching a needle bar from an endwise reciprocatory drive means during an extreme excursion of a needle bar gate carrying the needle bar. A latch release member, positioned adjacent the needle bar gate, may be manually elevated to a position where it will strike a lever mounted on the latch mechanism which will trip the latch mechanism at any position of the needle bar gate. A presser bar lifting lever, when elevated to a position beyond normal lift position, will lift a presser bar guide block to a position where it will strike a lug extension on the latch release member, thereby causing elevation of the latch release

member to disconnect the needle bar from its endwise reciprocatory driving mechanism. A tension spring will



elevate the needle bar to its upper most position when the needle bar is thus disconnected from its driving mechanism.

3,815,530

METHODS AND APPARATUS FOR FORMING SEAMS

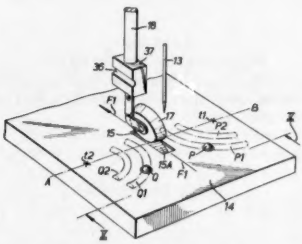
Michael Wade Denton, Crispin, Duck St., Wendens Ambo, Saffron Walden, England

Filed Oct. 31, 1972, Ser. No. 302,400

Claims priority, application Great Britain, Oct. 4, 1971, 51253/71

Int. Cl. D05b *27/10, 35/10*

U.S. Cl. 112—214 **38 Claims**



A sewing machine for stitching leather or fabric sheet is provided with means for manually or automatically steering a work sheet past the sewing head to ensure that the line of stitching follows a required path, the steering being effected by imposing a local frictional drag on the sheet at a point offset from the line of action of the mechanical feed of the machine.

The platen of the machine may be provided with a pair of domed studs which protrude upwardly one on each side of the feed line enabling the operator to press the work sheet down differentially on the studs with his fingers to effect a steering of the work by frictional drag.

In another arrangement a yoke plate is rigidly or tiltably mounted on the presser bar of the machine and carries a pair of downwardly-protruding domed pressure studs which when pressed down differentially provide the required steering action.

One of these pressure studs may be deeper than the other to act as an edge-follower for engaging a curved edge of the work sheet, whereby automatic steering of the work sheet is possible by which the seam will be stitched parallel to but inset from the edge being followed. Instead of cooperating with an edge of the work sheet itself, the edge-follower stud may follow an edge of a template or overlay placed on the work sheet, or an edge of a change in thickness or level in the work sheet, produced for example by a surface channel or the edge of an underlay.

The invention may be applied to cutting, welding, finishing and other linear work as well as to stitching.

3,815,531

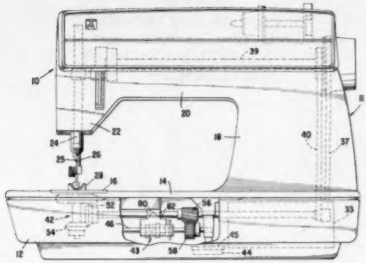
SEWING MACHINE EQUIPPED WITH PULSE GENERATOR

John W. Wurst, Dover, and James E. O'Brien, Kenilworth, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,835

Int. Cl. D05b *69/10*

U.S. Cl. 112—220 **8 Claims**



A sewing machine equipped with a pulse generating means capable of providing digitally coded signal pulses related to the angular position of the sewing machine main-shaft is disclosed. The total number of coded signals exceeds the number of angular position sensors employed. The preferred embodiment utilized two Hall effect devices to provide four binary coded signals responsive to the position of the sewing machine mainshaft.

3,815,532

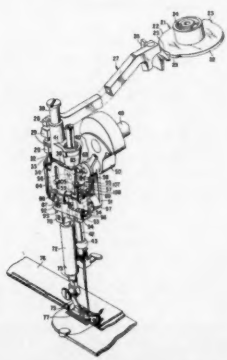
NEEDLE BAR RELEASE AND RAISING MECHANISMS

William Weisz, Rockaway, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Apr. 4, 1973, Ser. No. 347,984

Int. Cl. D05b *55/16, 3/02*

U.S. Cl. 112—221 **7 Claims**



A mechanism for use in a sewing machine having a latch mechanism affixed to a needle bar and connecting the needle

bar to an endwise reciprocating driving mechanism. The mechanism is supported by a guide block of a presser mechanism and is effective, when the presser mechanism is super-elevated, to disconnect the needle bar from its endwise reciprocating driving mechanism. In the preferred embodiment, a supporting member affixed to the presser bar guide block pivotably supports a bell crank, one arm of which contains a series of teeth. As the presser bar is being super-elevated a spring bias is applied to the bell crank causing the bell crank to be rotated, placing the teeth in contact with an arm of a latch lever of the latch mechanism affixed to the needle bar. Continued elevation disconnects the needle bar from its driving mechanism and also raises the needle bar a slight amount. Concurrently the presser foot is brought to a super-elevated position.

3,815,533

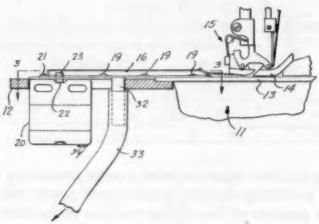
VACUUM THREAD TRIMMER

Murel B. Bray, El Paso, Tex.

Filed Feb. 6, 1973, Ser. No. 330,051

Int. Cl. D05b *65/00*

U.S. Cl. 112—252 **5 Claims**



A vacuum thread trimmer for attachment to a conventional sewing machine including a vacuum box connected to a vacuum machine with the vacuum box having a reciprocating cutter mounted therein and driven by an electric motor suspended below the sewing machine table. The vacuum box is hollow and the cutter is hollow so that as to permit the severed thread to pass therethrough to the suction outlet.

3,815,534

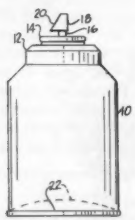
PRESSURE RELEASE VALVES FOR AEROSOL CANS

Raymond H. P. Kneusel, Flourtown, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Nov. 18, 1971, Ser. No. 199,929

Int. Cl. B21d *51/26*

U.S. Cl. 113—15 A **9 Claims**



A pressure release valve is located in the domed bottom of an aerosol can. A centrally located area in the domed bottom having a lesser resistance to eversion than the peripheral area in the domed bottom includes several score lines which meet at a common point in a spoke-like configuration. The flat area of the bottom will evert at a pressure of 170 to 200 p.s.i. so as to rupture the bottom at the score lines before any substantial eversion of the peripheral area occurs.

3,815,535

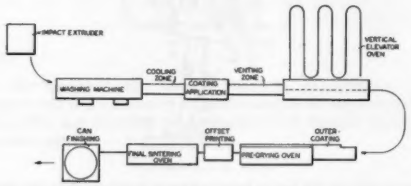
APPARATUS AND PROCESS FOR THE MAKING AND COATING OF HOLLOW BODIES

Georg Becker, Weingarten, and Karl Kleindrettle, Trossingen, both of Germany, assignors to W. L. Schwaab Lackfabriken KG, Inhaber: Gebruder Becker G.m.b.H., Weingarten u. Karlsruhe, Germany

Filed Dec. 14, 1972, Ser. No. 315,251

Int. Cl. B21d *51/26*

U.S. Cl. 113—120 A **3 Claims**



Metallic hollow bodies such as cans or other containers, particularly non-ferrous cans such as aluminum, are electromagnetically suspended and coated on their outside and inside surfaces simultaneously by applying, in an electrostatic field wherein the metallic hollow body is grounded, a resinous powder coating material, and whereafter the hollow body is subjected to a heat treatment, to result in formation of a continuous resin film coating on the surfaces of the hollow body. In the case of non-ferrous (e.g., aluminum) cans, cans susceptible to electromagnetic suspension are manufactured from aluminum (or other non-ferrous) sheet by adhering iron mesh to the cup-bottom during the cup-forming step.

3,815,536

FLOATING INSTALLATION

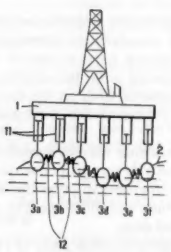
Xuony Nguyen Duc, Rueil-Malmaison, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil-Malmaison, France

Filed June 20, 1972, Ser. No. 264,469

Claims priority, application France, June 29, 1971, 71.23841

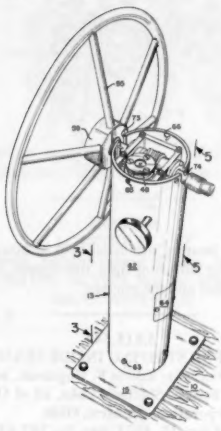
Int. Cl. B63b *35/00*

U.S. Cl. 114—.5 D **7 Claims**



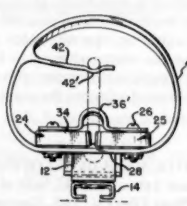
Floating installation having a platform, at least one element providing for the buoyancy of the installation and apparatus connecting the platform to the buoyant element. The element is constituted by at least one flexible, tight and deformable bag housing a determined mass of gas, which is sufficient for maintaining, during its operation, the platform and the connecting apparatus above the maximum level reached by the crest of the waves, thus reducing considerably the action of swell on the installation.

3,815,537
CONVERTIBLE PEDESTAL STEERING APPARATUS
Arthur G. Evans, 1609 3rd St., Manhatten Beach, Calif. 90266
Filed July 23, 1973, Ser. No. 378,769
Int. Cl. B63h 25/00
U.S. Cl. 114—144 R 10 Claims



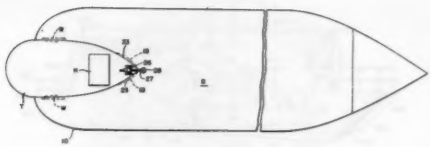
Apparatus for converting tiller steering of a boat to pedestal steering thereof and vice versa wherein said boat includes a rudder post extending generally upwardly from the deck thereof. A flange may be secured to the deck in a manner having the rudder post extending upwardly therethrough. A pedestal is removably secured to the flange and includes a lower drive shaft fixedly secured to both the rudder post and an upper main drive shaft. Universal joints may be associated with each shaft. The main drive shaft is rotatable about its vertical longitudinal axis within a gear box disposed at the top of the pedestal and includes a gear keyed for rotation therewith. A wheel shaft extends through aligned slotted apertures in the pedestal with both ends extending out of the pedestal and includes a worm gear keyed for rotation therewith and in meshing engagement with the first-mentioned gear. A wheel is removed secured to one end of the wheel shaft and keyed for rotation thereto.

3,815,538
CAM CLEAT RELEASING MECHANISM
Donald Jurgich, 2632 S.W. 167th, Seattle, Wash. 98166
Filed May 4, 1973, Ser. No. 354,321
Int. Cl. B63b 21/08
U.S. Cl. 114—218 4 Claims



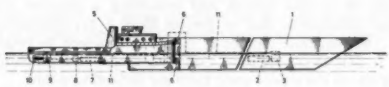
A releasing mechanism for cam cleats in which a fairlead over which a sheet (rope) can be optionally guided, is offset from the cleat such that when the sheet (rope) is guided by the fairlead and is tensioned, a releasing force component is created to free the sheet from the cleat.

3,815,539
SINGLE HULL TUG AND BARGE CONSTRUCTION
John N. Stevens, West Palm Beach, Fla., assignor to Catug Corporation, Fort Lauderdale, Fla.
Filed Oct. 16, 1972, Ser. No. 297,804
Int. Cl. B63b 21/00
U.S. Cl. 114—235 R 5 Claims



An integrated single hull tug and barge unit capable of operation on the high seas is produced by providing a cargo carrying unit such as, for example, a barge unit, with a recess area in the aft end thereof with the recess area being contoured and dimensioned to receive and support the forward portion of the hull of a tugboat unit in substantially tight interfitted relationship. The tugbot unit has the forward or bow portion of the hull shaped to conform with the curvature of the recess area at the aft end of the cargo carrying unit so that a substantially tight mating engagement therebetween is achieved. The forward end of the recess area of the cargo carrying unit on either side thereof is provided with a recess area forming support members on each side. The forward end of the tugboat unit on each side of the hull is provided with a shoulder member complementary with and supported by the support member of the recess area of the cargo carrying unit. Positively driven sliding wedge units or like wedging means are positioned between the cargo carrying unit and tugboat unit engagements to insure a tight engagement and to eliminate any relative movement between the tugboat and the cargo carrying unit. Further, positively driven connecting add disconnecting means are provided between the forward end of the tugboat unit and the aft end of the cargo carrying unit at the recess area thereof to draw the tugboat and the cargo carrying unit tightly together and thus prevent the tug from moving aft relative to the cargo carrying unit.

3,815,540
DRILLING PLATFORM WITH CORRESPONDING SUPPLY VESSEL
Hans Peereboom, Delft, Netherlands, assignor to N. V. Industrieele Handelscombinatie, Rotterdam, Netherlands
Filed Feb. 9, 1973, Ser. No. 331,175
Claims priority, application Netherlands, Feb. 10, 1972, 7201761
Int. Cl. B63b 35/44
U.S. Cl. 114—235 R 4 Claims



A marine drilling platform is recessed at one side to receive one end of a supply vessel in pushing or pulling relationship. Both the platform and the vessel have power sources comprising motors, but only the supply vessel has propulsion means. The power from both the platform power source and the supply vessel power source is applied to the propulsion means of the supply vessel, thereby taking advantage of the power which must in any event be provided on the drilling platform for drilling operations and the like.

3,815,541

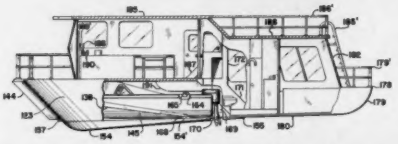
HOUSEBOAT POWERED BY SMALLER BOAT

Clarence C. Hansen, 40 N. 130 St., Bonner Springs, Kans. 66012

Continuation-in-part of Ser. No. 218,894, Jan. 19, 1972, abandoned. This application Apr. 25, 1973, Ser. No. 354,329

Int. Cl. B63b *21/00, 35/44*

U.S. Cl. 114—235 R 22 Claims



A houseboat structure includes a forward opening well into which a relatively small power boat is received and retained to provide motive power. The forward location of the small boat permits, among other advantages, rear beaching of the larger boat and greater overall versatility. Alternate forward tow positions of the small boat are permitted through the use of a slidable retaining frame in the boat receiving well.

3,815,542

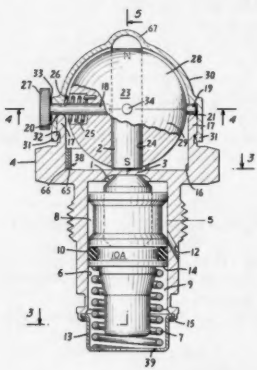
MAGNETIC PRESSURE INDICATOR

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed July 27, 1972, Ser. No. 275,854

Int. Cl. G01l *19/12*

U.S. Cl. 116—70 20 Claims



A magnetic differential pressure indicator is provided for detecting in a fluid system and indicating a pressure differential thereacross that is greater than a predetermined value. The magnetic indicating means is arranged to rotate about an axis after actuation, upon movement of a pressure-sensing piston towards or away from the indicating means.

3,815,543

TRANSMISSION CONTROL INDICATOR MECHANISM

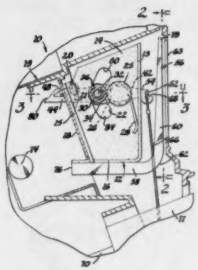
Ray E. Bush, Drayton Plains, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1972, Ser. No. 277,624

Int. Cl. G09f *9/00*

U.S. Cl. 116—124 R 3 Claims

The drawings illustrate a simplified, compact and efficient instrument panel-mounted shift indicator mechanism including combined camming and slidable pivot means for guiding a pointer along a substantially vertical path adjacent a light conducting member bearing the usual shift selector indicia, and lighting means for diffusing light throughout both the light conducting member and the pointer.



3,815,544

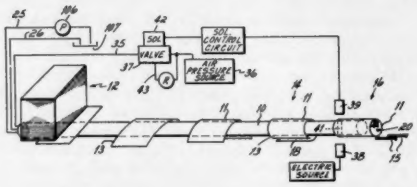
APPARATUS FOR STRIPING INSIDE SEAMS OF CANS

Alvin A. Rood, Westlake; Edwin F. Hogstrom, and William C. Stumphauzer, both of Sheffield Lake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 19, 1971, Ser. No. 107,632

Int. Cl. B05c *11/00*

U.S. Cl. 118—2 13 Claims



An apparatus for applying an impervious protective coating over the seams of cylindrical metal can bodies either before or after the seams are welded, soldered, or cemented and prior to spray coating the complete interior of the bodies. The apparatus is operable to intermittently apply an airless spray to the interior seams of the cans as they continuously move past an airless spray gun secured to the end of a stubhorn of a can forming line. The apparatus includes a new and improved airless spray nozzle which is operable to atomize the spray nearer the nozzle than has heretofore been possible. It also includes a pair of air jets located on opposite sides of the spray and operable to confine the atomized spray or fog to the seam of the can so that little or no excess material is sprayed onto that portion of the can located adjacent the seam.

3,815,545

ELECTROPHOTOGRAPH DEVELOPING APPARATUS

Masamichi Sato, and Takao Komaki, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 24, 1971, Ser. No. 201,644

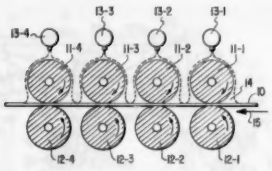
Claims priority, application Japan, Nov. 25, 1970, 45-103956

Int. Cl. G03g *13/00*

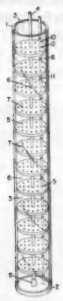
U.S. Cl. 118—637 7 Claims

In liquid electrophotographic developing apparatus wherein the electrophotographic material is passed between a series of

roller pairs, in at least the first roller pair the roller facing the latent image on the electrophotographic material is of an insulating material or coated with an insulating material, the remaining roller pair(s) being development rollers.



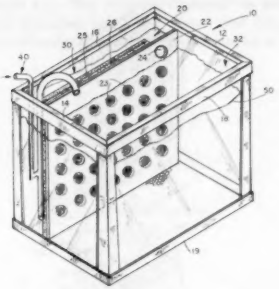
3,815,546
LOBSTER PLANT
Emile A. P. Plante, Badgers Inland, Kittery, Maine 03904
Filed Oct. 10, 1972, Ser. No. 296,041
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **11 Claims**



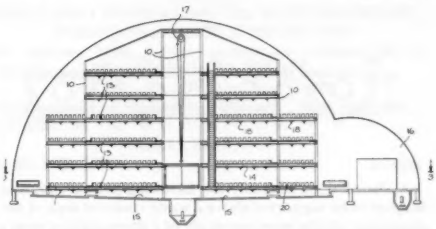
A lobster growing plant is the subject matter of this invention and each plant includes two separate vertical transparent cylindrical tanks for the growing of lobsters in two stages. The first tank is somewhat similar to the second tank except for size and differences in construction because of the larger size tank. Baby lobsters of about ⅛ inch size are placed, one to a compartment, in the small tank. In about four months these baby lobsters have grown to between 1½ to 2 inches in size. Then they are transferred to larger compartments in the larger tank, one to each compartment. In the larger compartments of the second tank these lobsters grow to 1½ to 2 pounds. Each tank has sea water and air circulating from the bottom to top and feed means are provided for each compartment in both tanks. The water in the tanks is temperature controlled for proper health and growth of the lobsters.

3,815,547
FILTERING DEVICE
Allan H. Willinger, New Rochelle, and Albert J. Dinnerstein, Brooklyn, both of N.Y., assignors to Metaframe Corporation, Maywood, N.J.
Filed Oct. 13, 1972, Ser. No. 297,380
Int. Cl. A01k *63/00*
U.S. Cl. 119—5 **16 Claims**

A filtering device for use with an aquarium filled with a liquid has a lower porous filtering portion positioned below the surface level of the liquid and an upper non-porous portion positioned above the level of the liquid. The filtering device is arranged in a generally vertical plane in the aquarium to form first and second compartments. A pump, of any conventional type, is provided to pump the liquid from one compartment to the other and to cause a differential surface level of the liquid in the compartments, this causing a flow of liquid through the lower porous portion of the filtering device from the compartment having the higher liquid level to the compartment having the lower liquid level. A hole is provided in the upper non-porous portion, normally located above the liquid level, to permit liquid to flow from one of the compartments to the other in the event that the lower porous portion becomes clogged to thereby prevent normal filter flow — as when the filtering device must be cleaned or replaced. The filtering device advantageously includes at least one higher porosity portion facing the compartment having the higher liquid level and at least one lower porosity portion facing the compartment having the lower liquid level.



3,815,548
STRUCTURAL SUPPORT APPARATUS
Bruce A. Blair, Streator, Ill., assignor to International Farm Systems Inc., Streator, Ill.
Filed Jan. 10, 1972, Ser. No. 216,567
Int. Cl. A01k *01/00*
U.S. Cl. 119—16 **6 Claims**



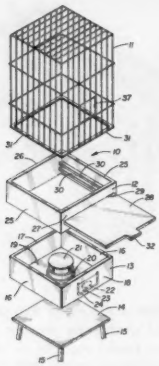
This invention is for a novel means of structural support for buildings and the like and is especially adapted for supporting a structure for feeding and maintaining animals in a confined environment.

The invention utilizes structural members which also serve as dividers between the useful floor area of the structure. The floor of the structure is mounted below the structural members rather than being mounted on the top as is traditional. The arrangement provides that a single structural member will serve as a divider, an increased load support, and a shield for the connecting means. The connecting means are such as to allow rapid assembly in sections or modules and rapid disassembly as well.

3,815,549
SPLIT LEVEL BIRD CAGE
Arthur Opmeer, 2112 Zion Rd., Grand Junction, Colo. 81501
Filed Apr. 19, 1973, Ser. No. 352,517
Int. Cl. A01k *31/00*
U.S. Cl. 119—17 **7 Claims**

A bird cage is provided comprising an upper wire cage assembly, a lower base section and an intermediate or coupling

section. The open ends of the upper and lower section telescope into the coupling section to form a single enclosed bird cage. The coupling section is provided with a slot for insertion of a separator which closes off the interior of the coupling section forming two separate compartments within the cage. By isolating the birds in one compartment, the opposite compartment may be separated from the cage and



cleaned as desired. Covered water and seed cups are centrally located on the floor surface of the bottom section.

3,815,550

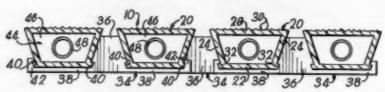
FLOOR ASSEMBLY FOR ANIMAL ENCLOSURES

Julius C. Becker, Downs, Kans., assignor to Becker Manufacturing Company, Incorporated, Downs, Kans.

Filed Sept. 5, 1972, Ser. No. 286,192

Int. Cl. A01k *1/00*

U.S. Cl. 119—28 **5 Claims**



A slatted floor assembly for farrowing pens or the like is adapted to be supported above a waste cleanout area. A set of elongated, tubular members made of a thermoplastic resin are held in a spaced, longitudinally parallel relationship by a plurality of underlying spacer elements that clip over and grip corresponding longitudinal projections which are integral to the members and extend laterally in opposite directions therefrom. The members, which are normally open ended, may be provided with conduit means placing all of the members, or only certain selected ones, in communication with one another and with a pump and a heating or cooling unit, in order that a temperature-controlling liquid may be circulated through the members for heating or cooling purposes.

3,815,551

HORSE WALKER

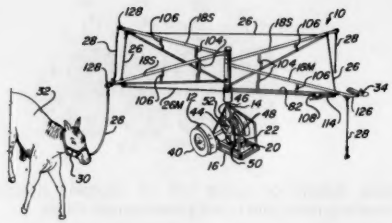
David D. Losaw, Rt. 1, Box 78, Littleton, Colo. 80120

Filed July 5, 1973, Ser. No. 377,751

Int. Cl. A01k *15/00*

U.S. Cl. 119—29 **17 Claims**

This invention relates to a foldable trailer mounted horse walker characterized by two or more, preferably four, radially extending booms, one of which is drivingly connected to an upright centrally located drive shaft while the others are pulled around by the driven one due to connecting cables strung therebetween. When in the stowed towable condition,



the several booms are rotated around the central shaft and arranged in nested essentially coplanar relation.

3,815,552

METHOD OF AND APPARATUS FOR GENERATING, MAINTAINING OR RE-ESTABLISHING A VACUUM IN A VACUUM VAPORIZATION APPARATUS FOR HEATING ONE OR MORE LIQUIDS

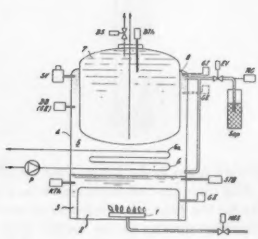
Zdenek Koula, Regensdorf, Czechoslovakia, assignor to Stotz & Co., Zurich, Switzerland

Filed June 11, 1973, Ser. No. 368,525

Claims priority, application Germany, June 12, 1972, 2228510

Int. Cl. F22b *33/02*

U.S. Cl. 122—33 **32 Claims**



A method of, and apparatus for, generating, maintaining or re-establishing a vacuum in an evacuated or vacuum vessel operating according to the vacuum vaporization principle for heating one or a number of liquids which are separated from one another. According to the invention a heating fluid medium is heated until an excess pressure prevails in the initially sealed vacuum vessel and the vacuum vessel is first then briefly brought into flow communication with the atmosphere until the excess pressure has at least partially diminished.

3,815,553

APPARATUS FOR THE PRODUCTION OF GAS

Fernand Antoine David, Epinal, France, assignor to Ateliers Henri Lardet, Vosges, France

Filed Dec. 4, 1972, Ser. No. 312,224

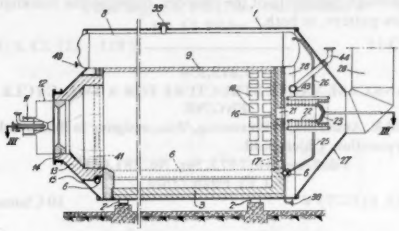
Claims priority, application France, Dec. 13, 1971, 71.44679

Int. Cl. F22b *21/14*

U.S. Cl. 122—235 R **6 Claims**

Apparatus for the production of gas by exothermic reaction and in particular by combustion of liquid, solid or gaseous materials, has a furnace and a heat exchanger mounted in a common envelope and means are provided for adjusting the outlet temperature of the combustion gases. The heat exchanger may be in the form of tube bundles housed in

lateral chambers flanking an elongate combustion chamber of the furnace. The means for adjusting the outlet temperature of the combustion gases may be adjustable orifices which provide communication between the lateral chambers and the adjacent spaces of the envelope. Further adjustable means may provide communication between the furnace combustion chamber and the outlet for the gases.



3,815,554

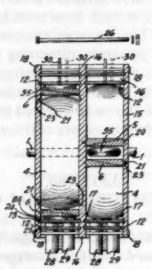
HUGHES ROTARY INTERNAL COMBUSTION ENGINE

Benjamin F. Hughes, Rt. 1, Box 120, Morris, Ala. 35116

Filed Mar. 15, 1971, Ser. No. 123,986

Int. Cl. F02b *53/10*

U.S. Cl. 123—8.09 **3 Claims**



A high thermal efficiency rotary engine having a housing elliptical in cross-section, to the axis, with a drumlike rotor mounted concentrically to a shaft, thus forming chambers. This rotor has a series of extendable and retractable vanes in openings machined in the outer edge of the rotor. The housing and rotor being capable of rotary movement in respect to one another, thus the volume of the chambers between the inner and outer members are varied during rotation by the extension and retraction of the vanes in an unique orbit with provisions made for intake and exhaust ports, which remain open.

Air or a combustible mixture is supplied by a carburator or fuel injector and compressed to the desired ratio. The ignition is by compresion or by an electric spark or combustion fired, developing a propelling force by the expanding gases acting upon the leading vane, afterward exhausted in the following sequence: the rotors, vanes and seals are shaped appropriately to rotate in the rotor housing.

3,815,555

HYDRAULIC HEAT ENGINE

Jean Andre Georges Tubeuf, Le Chesnay, France, assignor to Societe anonyme dite Societe Europeenne De Propulsion, Puteaux, France

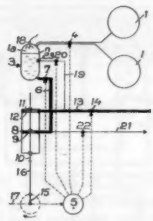
Filed Mar. 17, 1972, Ser. No. 235,481

Claims priority, application France, Mar. 19, 1971, 72.09846; Apr. 20, 1971, 72.14022

Int. Cl. F02b *75/00*

U.S. Cl. 123—19 **14 Claims**

An hydraulic heat engine having an upright cylinder with a first conduit thereto for introducing liquid, for example sea water, into the cylinder in which the liquid is in effect a piston leaving an expansion chamber space at the upper end of the cylinder into which propellant such as hot expanding gaseous media or a fuel mixture which expands upon combustion is introduced through a second conduit to expand and propel the liquid piston down and out through a third conduit from a lower part of the cylinder. This third conduit transmits the propelled liquid to a first transfer chamber to move a first piston therein mounted fast on a piston rod connected to rotatably drive an output shaft. The return stroke of the piston



rod moves a second piston mounted fast thereon in a second transfer chamber to push a fresh supply of liquid therefrom into the second conduit for admittance to the cylinder. Additional conduits are provided to admit fluid from a supply to the second transfer chamber during the second piston's down stroke and to exhaust the fluid from the first transfer chamber during the first piston's return stroke. A control device such as a cam arrangement driven by the output shaft controls valving in the conduits to regulate the supply of expansible propellant and the flow of liquid during the operating cycle.

3,815,556

DEVICE FOR CONTROLLING THE INJECTION OF FUEL IN INTERNAL COMBUSTION ENGINES

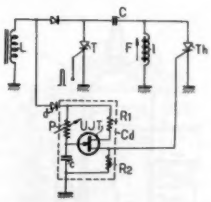
Eric Jaulmes, Paris, France, assignor to Ateligers De La Motobecane, Pantin (Seine Saint Denis), France

Filed May 10, 1972, Ser. No. 252,073

Claims priority, application France, May 12, 1971, 71.17094

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **1 Claim**



For a fuel control system of an internal combustion engine having a needle which lifts to admit fuel, an electromagnetic means is provided for lifting the needle which electromagnetic means is energized through discharging of a condenser, the condenser being charged through an alternator operated by the engine. The circuit connecting the alternator to the condenser and to the electromagnetic winding comprises means to cause the condenser to discharge and may also include means to change the time the needle is held in lifted position and to vary the magnetizing current.

3,815,557
COOLING INSTALLATION FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY FOR THE CYLINDER AND CYLINDER HEAD OF INTERNAL COMBUSTION ENGINES FOR AIRCRAFT

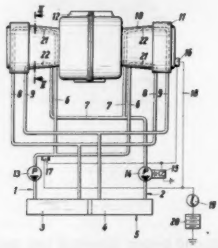
Ferdinand Piech, Stuttgart-Nord, and Hans Mezger, Ludwigsburg, both of Germany, assignors to Dr. -Ing. h.c.F. Porsche Kg, Stuttgart-Zuffenhausen, Germany

Filed Feb. 17, 1972, Ser. No. 227,037

Claims priority, application Germany, Feb. 20, 1971, 2108249

Int. Cl. F01p *7/16*

U.S. Cl. 123—41.02 **3 Claims**



A cooling system for internal combustion engines, especially for the cylinders and the cylinder heads of internal combustion engines for aircrafts, in which the internal combustion engine is cooled by means of a cooling liquid, whereby two cooling installations are used which include cooling medium circulatory systems that are completely separate from one another and operate independently of one another; each including a pumping arrangement the cooling medium lines of both cooling installations are thereby connected with each cylinder and cylinder head of the internal combustion engine. One of the pumping arrangements is responsive to the temperature in the area of one of the cylinders and cylinder heads and to the temperature of the cooling medium line in the other installation.

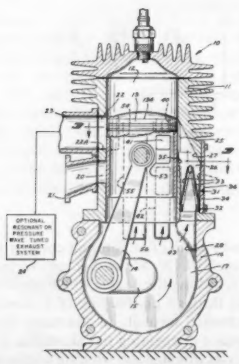
3,815,558
SCAVENGE PORTING SYSTEM

William L. Tenney, Crystal Bay, Minn. 55323

Filed Aug. 7, 1972, Ser. No. 278,423

Int. Cl. F02b *33/04*

U.S. Cl. 123—73 A **10 Claims**



In a two cycle internal combustion engine of the type which utilizes the underneath side of the power piston as a scavenge pump piston, the improvement which consists of extra height, piston valved scavenge ports which are additionally valved by reed valves located in the transfer passageway close to the scavenge ports, in order to increase the scavenge gas mass flow through capability of the cylinder, improve the scavenge gas flow pattern, or both.

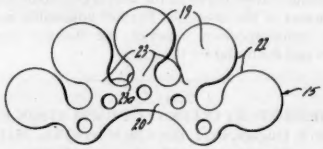
3,815,559
CRANKCASE VALVE STRUCTURE FOR A TWO-CYCLE ENGINE

Ronald R. Anderson, Winneconne, Wis., assignor to Brunswick Corporation, Chicago, Ill.

Filed Aug. 16, 1972, Ser. No. 281,036

Int. Cl. F02b *33/04*

U.S. Cl. 123—73 V **10 Claims**



An induction reed valve includes a valve block with a flat end face having ports. A bulb type reed is secured overlying each port. Each reed has an outer closure portion integrally interconnected to a common mounting strip by an hourglassshaped connecting portion defining a reduced width thickness within its length and thereby reduces the spring constant and the effects of inertia as the reed moves. A stop arm is located outwardly slightly in excess of the normal full position.

3,815,560
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

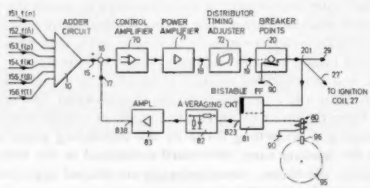
Josef Wahl; Heinz Moller, both of Stuttgart; Heinz Kammerer, Nellingen, and Richard Zechnall, Stuttgart-Nord, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 16, 1972, Ser. No. 298,108

Claims priority, application Germany, Mar. 9, 1972, 2211315

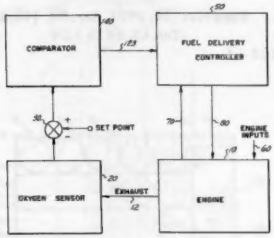
Int. Cl. F02p *5/04*; **F02b** *3/00*

U.S. Cl. 123—117 R **35 Claims**



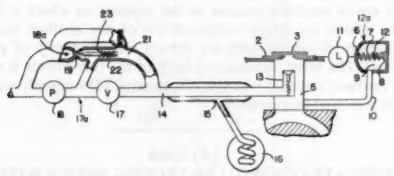
The timing of the distributor is adjusted by an electromechanical control loop in dependence on engine speed, intake manifold vacuum, exhaust gas composition, throttle position, or the like and includes electrical transducers to sense the parameters and electrical control amplifiers to provide output signals which are a composite of sensed and applied signals representative of the parameters and which control a force transducer to provide an output operating force acting on the distributor to control the timing of the ignition breaker points in dependence on a selected operating parameter, or on operating parameters, the loop preferably including a feedback branch to maintain the breaker operation in synchronism with engine rotation.

3,815,561
CLOSED LOOP ENGINE CONTROL SYSTEM
William R. Seitz, Farmington, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed Sept. 14, 1972, Ser. No. 289,200
Int. Cl. F02m 7/00
U.S. Cl. 123—119 R 11 Claims



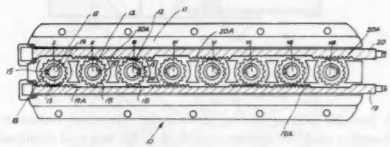
A closed loop engine control system for internal combustion engines is described. The control system is responsive to signals indicative of the presence or absence of oxygen in the exhaust gas of the engine and is operative to generate an output signal for receipt by a fuel delivery controller which will cause that fuel delivery controller to increase fuel delivery in the presence of oxygen molecules in the exhaust gas and to decrease fuel delivery in the absence of oxygen molecules in the exhaust gas in order to maintain the fuel delivery at the predetermined, and preferably the stoichiometric, air/fuel ratio mixture point.

3,815,562
PRESSURE COMPENSATED AIR THROTTLE AND AIR-FUEL CONTROL SYSTEM
Merle Robert Showalter, 4733 Shoremead Rd., Richmond, Va. 23234, and Samuel Rhine, RFD 424A, Tillson, N.Y. 12486
Filed Mar. 8, 1973, Ser. No. 339,156
Int. Cl. F02m 39/00; F02b 3/00; F02m 23/00
U.S. Cl. 123—119 R 9 Claims



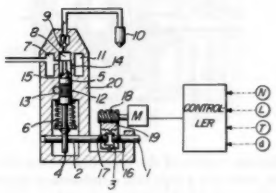
An air throttle is disclosed which meters a constant airflow for each control position over the range of manifold vacuums encountered in engine operation. Throttle metering area is the product of two perpendicular openings, an x-opening proportional to desired airflow and a y-opening controlled as a function of manifold vacuum to compensate throttle area for variations in manifold vacuum so that airflow for a given x-opening is constant or a desired function over the range of manifold vacuums. If flow per unit area is a function of intake manifold vacuum g(IMV) the y-opening of the throttle is proportional to 1/g(IMV) to maintain constant airflow at a given control setting x. If fuel flow is controlled proportionately to x and an air-fuel ratio function h(IMV) is desired, the throttle will produce it with a y-opening controlled to vary in proportion with h(IMV)/g(IMV).

3,815,563
FUEL INJECTION SYSTEM FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE
Ernest E. Stinsa, 66 W. Gun Hill Rd., Bronx, N.Y. 10467
Filed Nov. 24, 1971, Ser. No. 201,728
Int. Cl. F02d 1/02; F02m 39/00
U.S. Cl. 123—139 R 1 Claim



This disclosure is directed to an improved fuel injection system for use with internal combustion engines comprising a plurality of plunger type injection pumps in which the operation of the respective pumps is controlled in a manner which selectively permits certain predetermined numbers of pumps to be shut-off to prohibit the delivery of fuel to the engine cylinders fed thereby while the remaining pumps may be operated to effect fuel delivery to the engine cylinders fed thereby or whereby all of the fuel injection pumps may be rendered operative or inoperative. An accelerator and governor are operatively connected to the respective pumps to vary the amount of fuel the operative fuel pumps deliver to the cylinders fed thereby in accordance to the load imposed on the operating cylinders.

3,815,564
FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES
Toshi Suda, Nagoya; Tetsuji Akashi, Oobu, and Hidetoshi Dohshita, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan
Filed Mar. 3, 1972, Ser. No. 231,471
Claims priority, application Japan, Mar. 6, 1971, 46-11941
Int. Cl. F02m 39/00
U.S. Cl. 123—139 AP 10 Claims



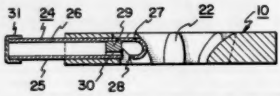
Electrical signals representing the revolutions, load, temperature and acceleration of the revolutions of the internal combustion engine are detected and introduced into a controller, the output of which is used to actuate a servo motor or electromagnetic valve, whereby the time at which the fuel injection pump starts operating is controlled, thus preventing any undesirable combustion products from being produced.

3,815,565

SONIC-WAVE FUEL AIR HOMOGENIZING DEVICE

William M. Stelter, 1772 E. 7000 South, Salt Lake City, Utah 84403

Filed Aug. 21, 1972, Ser. No. 282,439
Int. Cl. F02m *27/00*
U.S. Cl. 123—141 9 Claims



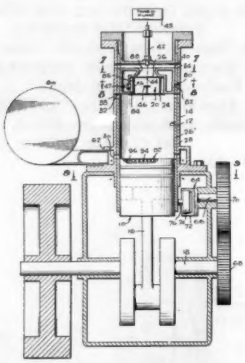
A fuel-air homogenizing device for insertion between the carburetor and the intake manifold of an internal combustion engine. The device increases carburetion in the sense that the fuel-air mixture entering and passing through the same is thoroughly mixed or homogenized. The device contains at least one and preferably both of the following features; first, a whistle is laterally disposed through the device such that the sound emitting portion is disposed in the central aperture area of the device that communicates with the carburetor and the intake manifold conduit. Reduced pressure at the intake manifold is relied upon to draw air in from outside the carburetion system, this to supply the sound waves within and below the device to aid in the mixing of the fuel and air; second, a plurality of mutually spaced ribs having rounded surfaces and angulated downwardly are used as deflecting means so as to further insure improved homogenization. Filter means may be provided relative to the ambient air supply.

3,815,566

ENGINE

Jesse D. Staggs, R.R. 2, Box 143, Fallbrook, Calif. 92028

Filed Feb. 8, 1973, Ser. No. 330,483
Int. Cl. F02b *23/00*
U.S. Cl. 123—191 R 10 Claims



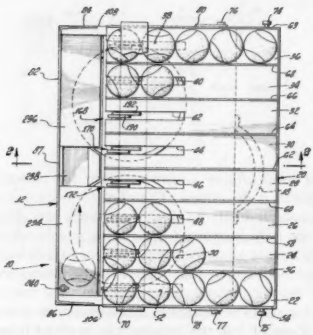
A low-pollution engine of the type that burns air and fuel to move a piston, wherein a separate combustion chamber is provided near one end of the cylinder and connected to the cylinder by a constricted passageway, the combustion chamber holding enough air to completely burn all of the fuel therein so that substantially only combustion products enter the cylinder. The walls of the combustion chamber are insulated so that they remain heated, and a perforated plate connects the combustion chamber to the cylinder so that the hot combustion products pass through the plate into the cylinder to heat extra air therein and move the piston. The combustion chamber and cylinder are both purged but by different amounts of air, and fuel is admitted to the combustion chamber by an injection nozzle whose fuel stream hits a target in the combustion chamber to further break up and disperse the fuel.

3,815,567

COACTING WHEEL BALL PROJECTING DEVICE

Norman R. Serra, 735 Ocampo Dr., Pacific Palisades, Calif. 90272

Filed Nov. 15, 1971, Ser. No. 198,674
Int. Cl. F41b *3/04*
U.S. Cl. 124—1 4 Claims



A ball throwing machine utilizing two counterrotating wheels positioned so as to grasp between their peripheries, such as a tennis ball, and project it along the mutual tangent line of the counterrotating wheels. A plurality of feed magazines discharging balls one at a time in timed sequence for grasping and projection by the counterrotating wheels. The sequential timed release of balls from the columns of balls in the respective feed magazines is effected by a plurality of escapement mechanisms, one of which is positioned adjacent the exit end of each of the respective feed magazines. The angle and speed at which the ball is projected are adjustable by changing the speed at which the wheels rotate and angle of the entire machine relative to the support on which it rests. The wheels are driven independently of one another, and the escapement mechanisms are driven independently of either wheel. The inner structure of each of the two wheels is made of resilient material which is compressed substantially when a ball is moved therebetween.

3,815,568

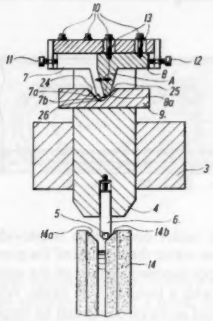
TEMPLATE CONTROLLED TRUEING DEVICE WITH AN ADJUSTABLE TEMPLATE FOLLOWER

Heinz Gerner, Coburg, Germany, assignor to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg/Bayern, Germany

Filed July 24, 1972, Ser. No. 274,300
Claims priority, application Germany, July 28, 1971, 2137730
Int. Cl. B24b *53/08*
U.S. Cl. 125—11 TP 4 Claims

A template trueing device for form wheels having straight lined profile sides consisting of a slide support, a horizontal side which can be displaced on the support parallel to the grinding disc axis and a copying slide conducted at right angles to the grinding disc axis. A shaping diamond is arranged at the lower end of the copying slide and the scanning sides of which extend parallel to the profile side. A scanning spur is arranged

at the upper end of the copying slide and scans the profile of a stationary template arranged on the slide support by means of scanning surfaces which extend parallel to the profile sides of the template. At the top end of the copying slide, there are provided two scanning spurs which can be displaced relatively



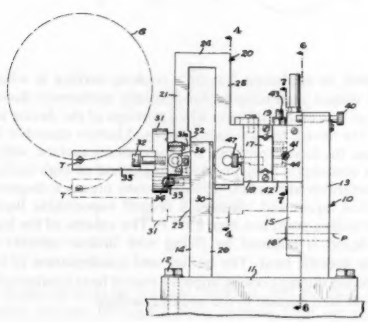
to each other parallel to the grinding disc axis and can be locked, one scanning spur scanning with a scanning surface the right hand profile side of the template and the other scanning spur scanning with a scanning surface the left hand profile side of the template.

3,815,569

INVOLUTE GRINDING WHEEL DRESSER

Vernon A. Riddell, 23402 Lynnhurst, Mount Clemens, Mich. 48043

Filed Aug. 7, 1972, Ser. No. 278,290
Int. Cl. B24b *53/08*
U.S. Cl. 125—11 T **15 Claims**



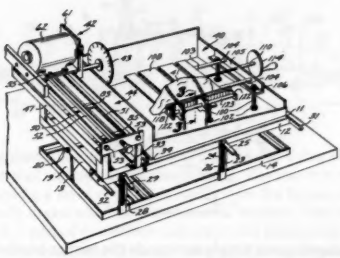
An involute grinding wheel dresser comprising a base and an arm pivotally mounted on said base for movement about a pivotal axis. A slide is mounted on the arm by anti-friction means for movement transversely of the arm. A dressing tool is mounted on the slide and interengaging means are provided between the base and the slide and are operable to limit movement of the slide with respect to the arm, as the arm is swung about the pivotal axis, in a direction such that the tool moves radially outwardly as well as tangentially to define an involute curve.

3,815,570

SAW APPARATUS PARTICULARLY USEFUL IN CUTTING ROCK

Samuel M. Story, 11352 Stanford Ave., Garden Grove, Calif. 92640

Continuation of Ser. No. 804,735, Feb. 13, 1969, abandoned.
This application Oct. 12, 1971, Ser. No. 188,387
Int. Cl. B28d *1/04*
U.S. Cl. 125—14 **17 Claims**



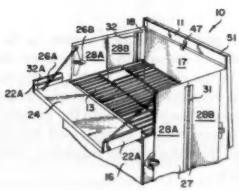
An improved saw having cutter means including one or more saw blades mounted on a carrier which is freely movable on a track along a predetermined path, and including means for tilting that track relative to horizontal in order to selectively control the amount of gravitational force urging the saw blade, or blades, toward the lower end of the track, and said cutter means further including provision for using a single saw blade in either of two positions in order to substantially double the thickness of stone which the saw blade may cut; and said saw further including a vise which may be adjusted relative to the path of movement of the saw blade, which vise includes one or more chains which may be used, at a variety of positions, to grip a rock to be cut against the bed of the vise, and further including a cam and wedge system which enables the locking chains to be rapidly attached.

3,815,571

FOLDABLE AND PORTABLE GRILL

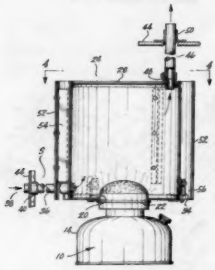
John F. Heffelfinger, 14927 Kenton, Midlothian, Ill. 60445

Filed Apr. 12, 1973, Ser. No. 350,619
Int. Cl. F24c *1/16*
U.S. Cl. 126—9 R **4 Claims**



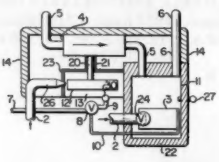
A portable cooking unit comprising sheet metal ends and sides. The sides are each made of two sections, foldable relative to each other and to the ends so as to fold inwardly and form a barrier between the ends. A grill is pivotally connected on one of the ends and a grate on the other of the ends. The folded side wall sections form a partition or barrier between the grill and grate.

3,815,572
SAFE STOVE FOR CAMPERS
Robert T. Wolfe, Rt. 2, Box 22A, Arlington, Wash. 98223
Filed Jan. 17, 1973, Ser. No. 324,483
Int. Cl. F24c 1/16
U.S. Cl. 126—59 9 Claims



An adapter plate snugly surrounds the burner head of a fuel burner and seals against ambient air ingress to the burner head from the region immediately surrounding it from below. The adapter plate and a side and top wall unit together define an oxidation chamber into which the burner head extends and which is a closed chamber with respect to the space being heated. A first conduit brings air into the oxidation chamber from a region outside of the space and a second conduit conducts exhaust gases out from the oxidation chamber, through said space, and discharges them outside of said space.

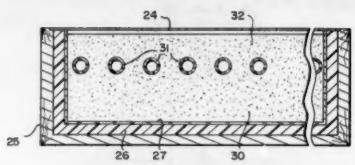
3,815,573
DIVING SUIT HEATER
Douglas Larry Marcus, Baltimore, Md., assignor to Joseph M. Schwartz, Lutherville, Md., a part interest
Filed Dec. 12, 1972, Ser. No. 314,373
Int. Cl. F25b 9/02
U.S. Cl. 126—204 5 Claims



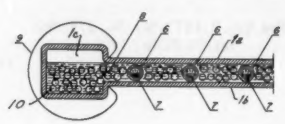
A self-contained, portable heating system to be used by a diver which consists of an aerothermodynamic heat source commonly known in the art as the Vortex tube used for heating the compressed breathing gas, a heat exchanger to heat a circulating fluid and exchange heat with the breathing gas, and a pump which is driven by the compressed breathing gas to circulate the heated fluid through an insulated, channeled diving suit or underdress.

3,815,574
SOLAR HEATING SYSTEM
George Roy Gaydos, Jr., Rt. 1 P.O. Box 319A, Brandywine, Md. 20613
Filed June 1, 1973, Ser. No. 366,148
Int. Cl. F24j 3/02
U.S. Cl. 126—271 4 Claims

A heating system includes a fluid circuit with a pump and filter for heating water for a pool. A valved bypass circuit includes a heat absorption unit which can be included in the circuit when desired. The heat absorption unit includes a relatively shallow container of thermally nonconductive material such as wood, the interior of which is lined with a layer of foamed polystyrene. The receptacle thus formed is lined on its interior with builder's foil and contains a relatively thick layer of sand in which is buried a continuous array of pipe either in sinuous configuration or, alternatively, a plurality of parallel pipe lengths extending between headers. In either configuration an inlet and outlet connection is provided so that the pump can circulate water through all of the pipe in the absorption unit. The upper exposed surface of the sand in the unit, at least, is covered with a layer of iron oxide. Alternatively, the sand can be omitted and iron oxide can be employed to fill the entire box. Finally, a layer of crystal glass closes the upper surface of the box which is then mounted so as to receive solar radiation.



3,815,575
COOKING UTENSIL
Louis J. Danis, 522 E. Minges Rd., Battle Creek, Mich. 49015
Continuation-in-part of Ser. No. 209,121, Dec. 17, 1971, abandoned. This application Feb. 27, 1973, Ser. No. 336,271
Int. Cl. A47j 27/024
U.S. Cl. 126—390 9 Claims

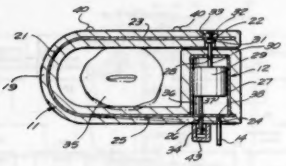


A utensil, or appliance, having a cooking surface in which the heat output area remains substantially isothermal during cooking of substances thereon while portions of the device are heated. The device has a suitably disposed hollow chamber intermediate the heated portions and the cooking surface, which chamber contains a first nonvaporizing liquid of high boiling point, preferably above 500° F. Sealed tube means is disposed in said first liquid and contains a second vaporizable liquid having a boiling point less than 250° F. The volume of the high boiling liquid is reduced by filling with hollow spheres of negligible specific heat. The boiling and condensation of the second liquid during cooling improve rate of heat conductivity from the heated portion to the cooking surface.

3,815,576
ARTIFICIAL SPHINCTER
Donald Roy Balaban, 618 Clearwood Dr., Richardson, Tex. 75080
Filed Jan. 26, 1973, Ser. No. 326,636
Int. Cl. A61f 1/00; A61b 17/00
U.S. Cl. 128—1 R 9 Claims

An artificial sphincter including a U-shaped resilient clamp adapted to normally engage and close a urethra, a piston-cylinder device located between the ends of the clamp, and a fluid-filled flexible container connected by a tube to the

piston-cylinder device so that when the container is compressed the piston-cylinder device drives the clamp to an open position which permits urine to flow through the urethra. The clamp supports a screw which extends, by an adjustable amount, into the cylinder of the device and serves as a stop for the piston. The stop determines the minimum distance between the ends of the U-shaped clamp and, therefore, the maximum pressure exerted by the clamp against a urethra.



Further, the clamp includes tabs by which it may be surgically connected to the posterior side of a pubic bone and the container includes tabs by which it may be surgically connected to the anterior side of the pubic bone, so that the entire sphincter is located within the body. With this arrangement, the container may be compressed against the pubic bone from outside the body to open the urethra. Preferably, exposed surfaces of the clamp and container are covered by a protective silicone material.

3,815,577

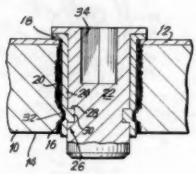
BACTERIAL SEALS

Louis Bucalo, Holbrook, N.Y., assignor to Investors In Ventures, Inc., New York, N.Y.

Filed July 10, 1972, Ser. No. 270,458

Int. Cl. A61b *19/00*

U.S. Cl. 128—1 R **12 Claims**



Bacterial seals for humans, animals, and the like. An outer sleeve extends through a body opening from the exterior of the body to an interior space therein, this outer sleeve having a tight, intimate engagement with body tissue so that is is securely connected with the tissue. An elongated member is situated within and surrounded by the sleeve and has an extremely close precise fit with the sleeve at the interface between the exterior surface of the elongated member and the interior surface of the sleeve. Through this elongated member it is possible to have any desired type of communication between the exterior of the body and the internal space. A barrier is located at the interface between the elongated member and the sleeve for preventing any bacteriological contamination of the interior body space from the exterior.

3,815,578

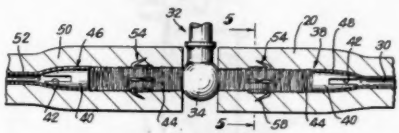
METHOD OF INSERTING AN IMPLANT INTO A PORTION OF A TUBULAR ORGAN WHOSE MUCOUS LINING HAS BEEN PARTIALLY REMOVED

Louis Bucalo, Holbrook, N.Y., assignor to Investors In Ventures, Inc., New York, N.Y.

Filed May 11, 1973, Ser. No. 359,429

Int. Cl. A61m *19/00*

U.S. Cl. 128—1 R **7 Claims**



An implant to be introduced into a cavity of a living body, as well as a tool and method for implanting. The tool is a reamer for removing a layer of mucosa which lines the lumen of a tubular body organ which is to receive the implant. The implant carries at a part of its exterior a structure for promoting the ingrowth of tissue, and with the use of the tool mucosa is removed only at the part of the tubular organ which is to be in engagement with the structure for promoting the ingrowth of tissue after the implant is introduced into the tubular organ. The implant carries at the region of the structure for promoting the ingrowth of tissue a fastening structure of hook-shaped configuration for hookig into the tissue of the tubular organ from the interior thereof to maintain the tubular organ in engagement with the implant, securely connected thereton, while the tissue has an opportunity to grow into intimate contact with the exterior of the implant.

3,815,579

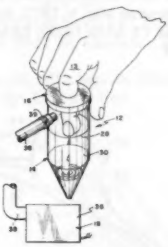
BLOOD WITHDRAWING MEANS

Shelby D. Rose, 321 E. 10th, Wellington, Kans. 67152

Filed June 5, 1972, Ser. No. 259,967

Int. Cl. A61b *5/14;* **A61m** *1/00*

U.S. Cl. 128—2 F **4 Claims**

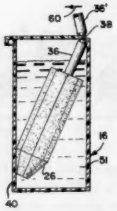


A blood withdrawing means including a housing means provided with a cover thereon and having vacuum means connected thereto whereupon one's pricked finger may be placed through the cover means and the vacuum pressure acts to draw blood rapidly therefrom. More particularly, the housing means has a serration interconnection or a screw type connection so that a lower portion can be removed for use in a centrifuge or other similar type medical testing equipment. In another embodiment of this invention, a blood withdrawing means is provided having a flask-like housing means with a cover means, a hanger assembly mounted in the housing means and a vacuum means connected to the housing means. A portion of an animal, such as an ear member, may be pricked and plaaced within the housing means and the vacuum pressure is utilized to remove the blood therefrom. The hanger structure is adjustable so as to be usable for various sizes of animals.

3,815,580
APPARATUS FOR AND METHOD OF COLLECTING AND PRESERVING CYTOLOGIC SAMPLES

Claude Oster, 976 Stuyvessant, Birmingham, Mich. 48014

Filed Aug. 31, 1972, Ser. No. 285,204
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 W 1 Claim

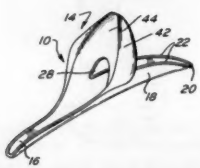


Apparatus is provided in a kit form for use in collecting cell specimens most generally from the vaginal tract and cervix region of a female person to preserve the specimens for subsequent cytologic study. A cell collecting device has a collecting end of a multi-ridge perimeter formed from sponge-like material with a handle at an opposite end. The cell sample collecting device has a notched shaft for separating the device collecting end from the device handle end in order for the cell collecting end to be separately sealed in a cell preservative solution included as a part of the kit. Additionally or alternatively, slides can be provided for depositing the collected cell sample thereon. A cell preservative fixative is applied over the specimens on the slides. The slides and/or the sealed device collecting end are then mailed or delivered for analysis.

3,815,581
URINARY DEVICE

Simon Levin, Rose Valley Rd., Wallingford, Pa. 19086

Continuation of Ser. No. 98,624, Dec. 16, 1970, abandoned.
This application Mar. 6, 1973, Ser. No. 338,612
Int. Cl. A61b *10/00*; E03d *13/00*
U.S. Cl. 128—2 F 9 Claims

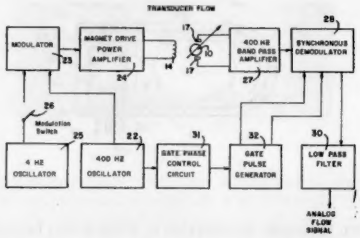


A urinary device to obtain a urine specimen from a female which is free of extraurethral contamination. The urinary device includes an extended trough member which is partially inserted into the vaginal passage and serves as a urine guide channel. A holding and placement member formed in one piece construction with the trough is positioned around the urethral meatus to direct urine flow into the urine guide channel. The device is geometrically molded to conform to the anatomy of the female when partially inserted into the vaginal passage and effectively separates as well as shields the structures around the urethral meatus while not imparting pressure on the urethra. A tampon may be attached to the trough to occlude the lower portion of the vagina without impinging on the urethral meatus.

3,815,582
MODULATED SINE WAVE FLOWMETER

William H. Schuette, McLean, Va., assignor to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Mar. 23, 1972, Ser. No. 237,262
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 F 6 Claims

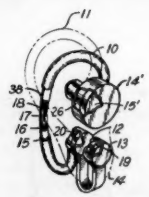


A gated electromagnetic sine wave flowmeter determines flow velocity of an ionizable solution whereby the unwanted quadrature signal, obtained during the maximum rate of change of the magnetic field, is gated out. Accurate gating is accomplished by modulation of the magnet drive amplitude during zero flow condition and adjusting the gate phase control until the effects of the modulated quadrature signal is nulled out.

3,815,583
PULSE MONITORING SYSTEM

Thomas R. Scheidt, 6302 W. 79th St., Indianapolis, Ind. 46278

Filed Jan. 19, 1972, Ser. No. 219,074
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 P 5 Claims



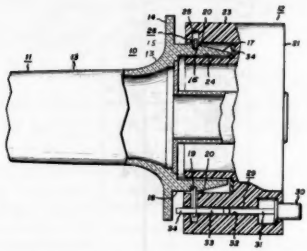
A system for automatically monitoring the heart pulse rates of patients. Each patient is provided with a holder mounted to the patient's ear having a light emitting diode which transmits light through the ear lobe to a light sensitive transistor. A transmitter located in the holder transmits the electrical signal received by the transistor as the light is pulsed by blood flowing through the lobe. Receivers are provided to pick up the electrical pulse signals of the transmitters. Heart failure detectors are connected to the receivers and determine when the electrical pulse signals or heart pulse rates exceed an upper preset limit or a lower preset limit. A visual and audio alarm is provided to indicate when the heart pulse rates exceed the preset limits. A clock is provided which automatically measures the expiration of time from the initiation of the alarm. The system includes a pulse monitor which allows the operator to select a given patient and determine the exact pulse rate of the patient.

3,815,584

SPECULUM BARREL AND RETAINER RING ASSEMBLY

John M. Fiore, Troy, N.Y., assignor to Bio-Analytical Laboratories, Inc., Troy, N.Y.

Filed Nov. 7, 1972, Ser. No. 304,570
Int. Cl. A61b 1/06
U.S. Cl. 128—6 15 Claims



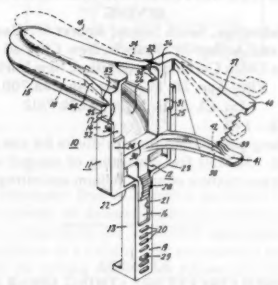
An open ended retainer ring or spring ring is combined with a repetitively manually operable linkage system at the opposed ends of the ring to expand and contract the ring. The ring is used in the handle part of a medical sigmoidoscope or speculum instrument to expand over the end of a plastic tube and contract within a groove in the tube to retain and release the tube with respect to the handle of the instrument.

3,815,585

DISPOSABLE VAGINAL SPECULUM

John M. Fiore, Troy, N.Y., assignor to Bio-Analytical Laboratories, Inc., Troy, N.Y.

Continuation-in-part of Ser. No. 106,346, Jan. 14, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,208
Int. Cl. A61b 1/32
U.S. Cl. 128—17 17 Claims



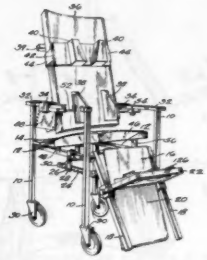
A vaginal speculum instrument comprising a pair of molded synthetic resin frame members each of which includes or defines a duckbill at one end thereof. Interconnection of the pair of frame members is provided by means of a sliding interfit relationship which provides duckbill mating, and adjustable parallel separation of one duckbill with respect to the other. A flexible hinge section at the base of one duckbill permits the duckbill not only to be angularly rotated with respect to the other duckbill, but also to provide further duckbill opening in one direction.

3,815,586

ORTHOPEDIC CHAIR WITH SCOLIOSIS PADS

Raymond A. Kazik, Milwaukee, Wis., assignor to Orthokinetics, Inc., Waukesha, Wis.

Filed Dec. 4, 1972, Ser. No. 311,595
Int. Cl. A61f 5/00
U.S. Cl. 128—70 9 Claims



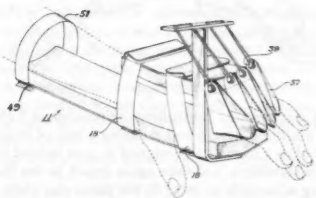
A pair of laterally and vertically adjustable scoliosis pads are attached to opposite sides of a chair in such position as to provide therapeutic contact with opposite sides of a person seated in the chair for treating curvature of the spine. The pads can be positioned in vertically staggered relationship to develop a therapeutic force couple across the seated person's trunk for tending to straighten out the curvature of the spine. A foot rest is attached to the bottom of the chair and two straps are attached at their center portions to the back of the footrest behind the seated person's heels. Three brackets having openings therein for receiving portions of the straps are attached in spaced relationship to the top portion of the footrest, one bracket on each side of the seated person's feet and one between the seated person's feet. The straps may be wound around the seated person's ankles, then passed through the openings in the brackets and the loose end fastened to each other on top of the person's feet to hold the bottom of the person's feet flat on the footrest to correct bent ankles.

3,815,587

HAND SPLINT FOR IMPLANT SURGERY

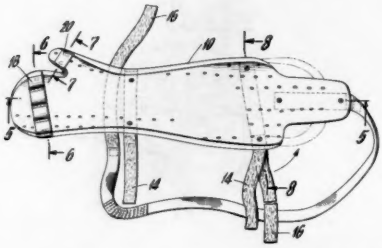
Edmonds L. Guerrant, 2822 W. Lancaster, Fort Worth, Tex. 76107

Filed Oct. 18, 1972, Ser. No. 298,561
Int. Cl. A61f 5/10
U.S. Cl. 128—77 9 Claims



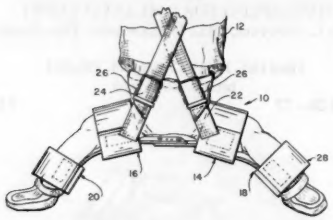
The specification discloses a splint for postoperative use following placement of implants in hand joints and which comprises a lower support member having padding material upon which one's hand is to be rested; an upper member having padding material to be placed against the back of one's hand; straps for coupling the two members together to hold them fixed relative to the hand; a post extending from the lower support member to be located between the thumb and the index finger; straps or loops to be fitted around the fingers; and resilient bands to be connected to the loops and to the post for pulling the fingers toward the post.

3,815,588
APPARATUS AND METHODS RELATING TO SUPPORT OF THE FOREARM
Bracha Klausner, 250 W. 94th St., New York, N.Y. 10025
Filed Oct. 27, 1972, Ser. No. 301,517
Int. Cl. A61f 5/10
U.S. Cl. 128—77 9 Claims



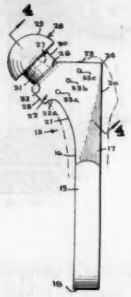
An apparatus and methods are disclosed which relate to supporting the forearm by means of a resilient, semi-rigid support member adapted to partially encircle and conform generally to the shape of said forearm when said forearm is positioned adjacent to the chest wall or body with the forearm pronated and the wrist and hand held in a functional position, said support member also including means adapted to retain said support member generally against the body or chest wall.

3,815,589
BRACE ASSEMBLY FOR CONTROLLING THE HIP POSITION IN A CHILD
Rex C. Bosley, 130 Mohawk Dr., Boulder, Colo. 80303
Filed Sept. 11, 1972, Ser. No. 287,753
Int. Cl. A61f 3/00
U.S. Cl. 128—80 A 21 Claims



A brace assembly for controlling the position of a child's hip or hips is disclosed herein and includes a pair of straps which are attached to a frame and designed to pass behind the child, up over his shoulders, and then again attach to the frame, the latter being adjustable so as to fit the particular child. The assembly includes a pair of thigh cuffs and a pair of calf cuffs, each cuff of which is generally semi-cylindrical in shape and suitably covered such as with a removable felt material. The thighs of the child are positioned within the thigh cuffs and upon fastening the felt material thereabout, the thighs are securely positioned within the cuffs. In a similar manner, the calf cuffs, which extend outwardly from the thigh cuffs, are attached to the child's calves. Through selective rotational movement of the thigh and calf cuffs to a predesired orientation or position and thereafter upon securing the cuffs in this predesired orientation or position, the position of the child's hip can be controlled.

3,815,590
OFF-SET TRIAL PROSTHESIS DEVICE AND METHOD FOR HIP PROSTHESIS SURGERY
William Minor Deyerle, 2222 Monument Ave., Richmond, Va. 23220
Filed May 2, 1973, Ser. No. 356,294
Int. Cl. A61f 5/04, 1/24; A61b 17/18
U.S. Cl. 128—92 EB 11 Claims



An off-set trial prosthesis device, and a method of use thereof, for precisely locating the proper final amputation site on the femur in performing hip prosthesis surgery or total hip surgery, including a body member to position against the femur having a recurved outer portion forming a handle, and including an inwardly off-set member having a threaded stud for mounting various sizes of replicas of femur prosthesis heads thereon. The template has plural drill guide holes through which a drill bit is passed to drill a series of holes in the femur demarking the precise location for final amputation of the femur to receive a femoral prosthesis member.

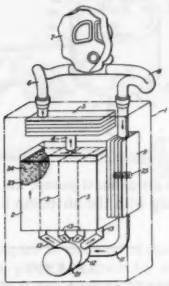
3,815,591
DIVING GAS MIXTURES AND METHODS OF DEEP DIVING
Heinz R. Schreiner, South Salem; Robert W. Hamilton, Tarrytown, and Arthur W. Francis, New City, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Apr. 28, 1972, Ser. No. 248,700
Int. Cl. A61k 27/00; A62b 7/02
U.S. Cl. 128—142 7 Claims

A breathing gas composition for divers for use at depths of from about 150–850 fsw consisting of oxygen and a three component gas mixture of neon, helium and nitrogen.

3,815,592
CLOSED CIRCUIT BREATHING APPARATUS
Charles H. Staub, Jr., Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed May 7, 1973, Ser. No. 358,173
Int. Cl. A62b 7/00, 9/00
U.S. Cl. 128—142 9 Claims

A plurality of chambers containing oxygen-generating and carbon dioxide-removing chemical have outlets connected with the inhalation tube of a breathing apparatus facepiece, and inlets connected by individual conduits to separate outlets in normally closed valve means provided with an inlet connected with the exhalation tube of the facepiece. Timing means operate the valve means to first connect the exhalation

tube with only one of said conduits and then at regular intervals thereafter to connect it additionally with each of the



remaining conduits in succession until it is connected with all of them simultaneously, thereby periodically reducing the rising breathing resistance of the apparatus.

3,815,593

STATIC RESPIRATOR FOR ARTIFICIAL RESPIRATION

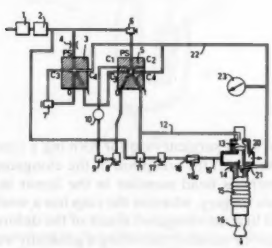
Georges Baumont, Paris, France, assignor to Le Materiel Medical Scientifique, Chelles, France

Filed Jan. 14, 1971, Ser. No. 106,483

Claims priority, application France, Jan. 16, 1970, 7001496

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.8 **11 Claims**



A static respirator free of movable members having components to operate on demand by simple suction applied by a patient and components for automatic application of a controlled respiration to a patient. The apparatus is provided with components for setting respiratory parameters for individual patients.

3,815,594

NEEDLELESS INOCULATOR

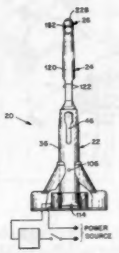
Norman R. Doherty, 870 Main St., Farmingdale, N.Y. 11713

Filed Aug. 10, 1972, Ser. No. 279,644

Int. Cl. A61m *31/00*

U.S. Cl. 128—173 H **10 Claims**

A needleless injector is provided with a body portion having a chamber for receiving a vial containing a fluid material. Adjustable force applying means are positioned coaxially with the vial in order to discharge the contents thereof through a bore and into an injection head. Improved electrically



operated means are provided for cocking a spring member which is released by a manually operable trigger for dispensing the fluid from the head.

3,815,595

APPARATUS FOR DERMATOLOGICAL TREATMENT WITH A STEAM-OZONE MIXTURE

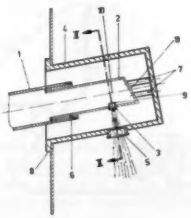
Hugo Bar, Forchheim, Germany, assignor to Deutsche Nemectron Gesellschaft m. b. H., Karlsruhe, Germany

Filed Aug. 24, 1972, Ser. No. 283,296

Claims priority, application Germany, Sept. 8, 1971, 2144861

Int. Cl. A61m *13/00*

U.S. Cl. 128—184 **15 Claims**



Cosmetic apparatus for dermatological treatment with a steam-ozone mixture, with a first pipe conducting the steam and comprising a discharge nozzle, and a second pipe which surrounds the first pipe, conducts the ozone or ozone-enriched and ionised air, and comprises a mixing nozzle, the mixture being formed by an ejector effect, the apparatus being characterised in that the steam pipe is arranged with an upward inclination towards the discharge nozzle, and the discharge nozzle comprises an inwardly-projecting collar.

3,815,596

DISPOSABLE FACE MASK

Gary F. Keener; Alcide Choiniere, both of Abbeville, and Charles G. Richitelli, Greenwood, all of S.C., assignors to Automation Industries, Inc., Los Angeles, Calif.

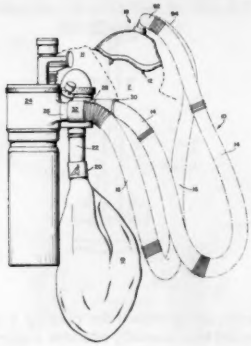
Filed Jan. 26, 1973, Ser. No. 326,798

Int. Cl. A61m *17/00*

U.S. Cl. 128—188 **24 Claims**

A disposable conductive anesthetic circuit is disclosed for eliminating respiratory infections caused by cross contamination from reuseable circuits. The disposable circuit is supplied in an hermetically sealed sterilized bag and includes an im-

proved face mask having an elastomeric base covered with a conductive film, an improved two-piece fitting having a Y-

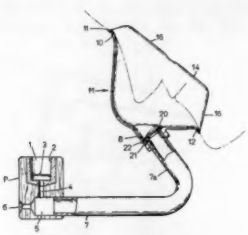


shaped portion and an elbow portion, a pair of hoses bonded to the Y-shaped portion of the fitting, and a breathing bag.

3,815,597
PIPE INHALER

William E. Goettelman, 2011 E. Park Pl., Milwaukee, Wis. 53211

Filed Nov. 24, 1972, Ser. No. 309,512
Int. Cl. A61m *15/06*
U.S. Cl. 128—196 **3 Claims**



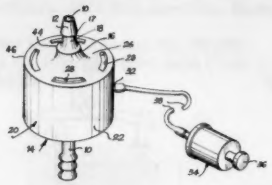
An inhaler including a flexible mask which is adapted to be inserted over the nose and mouth of the user and fits snugly against the face so that the smoke from a pipe can be inhaled The pipe has an auxiliary air inlet whereby the amount of air being inhaled along with the smoke can be varied.

3,815,598
INSTRUMENT FOR ADMINISTERING FLUID INTO A BODY THROUGH AN ORIFICE THEREIN

Alexander A. Vass, and Clara Vass, both of 309 E. 87th St., New York, N.Y. 10028

Filed Jan. 19, 1972, Ser. No. 219,144
Int. Cl. A61m *3/00*
U.S. Cl. 128—245 **7 Claims**

An instrument for administering fluid into a body through an orifice therein, which consists of a tube having an orifice entering end having means for being retained on the body during the administration of the fluid. The retaining means consists of an enlargement surrounding the tube adjacent said end and having concentric inner and outer concavities formed in its frontal surface defined by ridges adapted to form a seal with the body surface around the orifice; the outer concavity having an opening through its wall through which its interior is

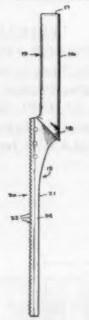


connected to an air exhaust pump; the means connecting the concavity opening with the air pump including a one-way air valve.

3,815,599
FEMORAL SHAFT SURGICAL RASP FOR USE IN HIP PROSTHESIS SURGERY

William Minor Deyerle, 2222 Monument Ave., Richmond, Va. 23220

Filed Mar. 2, 1973, Ser. No. 337,665
Int. Cl. A61b *17/32*
U.S. Cl. 128—305 **10 Claims**



A femoral shaft surgical rasp for forming a canal in an amputated femur shaft for reception of the elongated shank of a femoral prosthesis head member in the femur in performing hip prosthesis surgery, wherein the rasp has a working portion configurated like the elongated shank of the deformal prosthesis component or member providing a generally wedge-shaped zone, and has the cutting promenances of the rasp along one longitudinal edge only, with the remaining three surfaces smooth. By this design, damage to the abductor muscles and/or soft tissue which are in the working path of reciprocative movement of the rasp when forming the canal is avoided, and the instrument cuts more efficiently because the smooth surface opposite the cutting edge exerts a forciful wedging action toward the bone surface confronting the cutting edge.

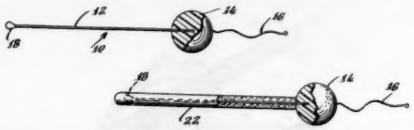
3,815,600
VAGINAL MEDICATOR

Harvey H. Groves, 6 Cherry Ln., Westport, Conn. 06880

Filed July 24, 1972, Ser. No. 274,263
Int. Cl. A61f *13/20;* **A61m** *31/00*
U.S. Cl. 128—271 **14 Claims**

A vaginal medicator adapted to be retained within the human vaginal canal to apply medication molded thereon to the vaginal canal and cervix including body-undissolvable stem and anchor means. The stem is formed into various shapes and lengths, each designed to reach along the length of

the vaginal canal from its lower end to the region of the cervix thus enabling medication molded thereto to be delivered where desired within the vaginal canal. The stem may include loops, webs and meshes for carrying additional medicaments and for increasing the application of medicaments to the cervix. The anchoring means may be a spherical, ellipsoidal or



cylindrical mass connected at one end of the stem adapted to hold the medicator in proper position by virtue of the constricting muscles at the entrance to the vaginal canal. Alternatively, the structure of the stem itself, such as a substantially triangular looped stem or a stem having a cervix surrounding loop at its inner end may adequately serve as the anchoring means.

3,815,601

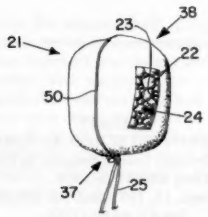
CATAMENIAL AGGREGATE ABSORBENT BODY

Jean Edward Schaefer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 254,004, May 17, 1972, abandoned. This application May 9, 1973, Ser. No. 358,773

Int. Cl. A61f *13/20*

U.S. Cl. 128—285 **30 Claims**



A tampon wherein the absorbent body is an aggregate of separate pieces of low modulus, resilient, absorbent foam. The aggregate is held together by an encasing overwrap which is relatively loose about the aggregate to permit some relative motion between adjacent pieces of foam. The mesh of the overwrap is fine enough to totally contain the absorbent pieces and thereby prevent surfaces of the absorbent pieces from penetrating the overwrap and forming part of the external surface of the tampon.

3,815,602

DISPOSABLE DIAPER

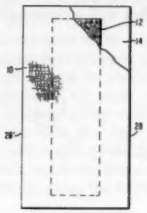
Martha Marie Johns, Wilmington, Del., and John Andrew Lynch, Jr., Chadds Ford, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1969, Ser. No. 889,607

Int. Cl. A41b *13/02*

U.S. Cl. 128—287 **2 Claims**

Improvements in disposable diapers of the type having moisture-absorbing cellulosic material sandwiched between a waterproof backing sheet and a cover fabric worn next to the body. The cover fabric is a light-weight apertured nonwoven of unbonded polyester fibers hydraulically entangled into a



strong fabric having durability in use, rapid transmission of fluid to the absorbing layer without wicking, and a dry feeling when the absorbing layer is wet.

3,815,603

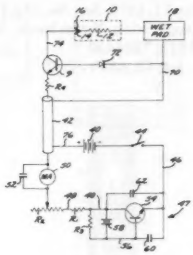
DEPILATORY METHOD AND MEANS

Bohumir Sramek, 19211 Edgehill Dr., Irvine, Calif. 92664

Filed Oct. 16, 1972, Ser. No. 298,178

Int. Cl. A61b *17/40;* **A61n** *3/04*

U.S. Cl. 128—303.18 **12 Claims**



A method by which to accelerate electrolytic destruction of hair. The method involves application to the hair papilla associated with the hair, of current having a unidirectional current component and a radio frequency current component. The unidirectional current produces ions which kill electrochemically. The radio frequency current accomplishes heating less than enough to result in radio frequency burning of the papilla but enough to accelerate the electrochemical processes. An apparatus furnishes unidirectional currents modulated at a radio frequency rate through an impedance changing circuit which constitutes a constant voltage source to the radio frequency generator and which constitutes a high impedance, constant current source to the body thereby to offer protection both to the subject and to the radio frequency generator.

3,815,604

APPARATUS FOR INTRAOCULAR SURGERY

Conor C. O'Malley, 1323 Glen Eyrie Ave., San Jose, Calif. 95125, and Ralph M. Heintz, Sr., P.O. Box 546, Los Gatos, Calif. 95030

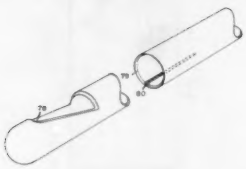
Filed June 19, 1972, Ser. No. 264,166

Int. Cl. A61b *17/32;* **A61m** *1/00*

U.S. Cl. 128—305 **11 Claims**

A pneumatically operated intraocular surgery apparatus which is of very light weight and small size, the part inserted into the eye having a diameter of 1 mm. or less. One embodiment of the invention employs a high frequency electric cur-

rent electrode for cutting or severing vitreous or other material, said electrode being provided with means for removing coagulated material adhering thereto. Other embodiment of this invention which are also of very small size and light weight employ concentric tubes with a pneumatic means for moving



one of the tubes with respect to the other at a slow or fast rate so that vitreous sucked into one of the tubes is sheared off by the sharp end of the other tube and the severed vitreous is sucked into a calibrated cylinder and at the same time saline solution is automatically supplied to the eyeball to replace the removed vitreous.

3,815,605

DEVICE AND HOLDER THEREFOR FOR INSERTING A HOLLOW COUPLING MEMBER INTO BONE MARROW

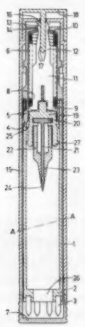
Ernst Machiel Schmidt, and Hendrik Alle Post, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1972, Ser. No. 252,375

Claims priority, application Netherlands, May 19, 1971, 7106896; Mar. 31, 1972, 7204420

Int. Cl. A61b *17/32*

U.S. Cl. 128—305 **13 Claims**



The invention relates to a device for inserting a hollow coupling member into the bone marrow of man or animals. Fluid may be supplied to the bone marrow through the inserted coupling member. The device according to the invention comprises an assembly of a striker-pin holder, a striker pin and a coupling member which is movably accommodated in an elongate housing and on which a force can be exerted by a source of energy provided in the device. When this force is exerted the striker pin and the coupling member are driven into the bone marrow, whereupon the coupling member can be detached from the remainder of the device.

3,815,606

ENDOTRACHEAL CATHETER

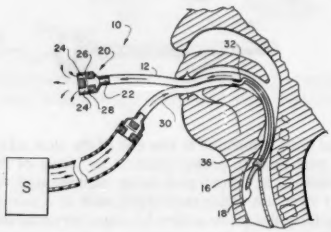
Charles N. Mazal, Roma 19, Mexico 6, D.F., Mexico

Filed Sept. 21, 1972, Ser. No. 290,964

Int. Cl. A61m *16/00*; **A61b** *17/24*

U.S. Cl. 128—351 **4 Claims**

An endotracheal catheter especially useful for the application of mechanical respiration or the administration of anesthetic gases to newborn infants. A pliable hollow outer tube is formed with a main body portion of constant diameter having a reduced diameter relatively short end section at one end. When inserted into the trachea, the shoulder at juncture of the main body and end section of the outer tube is seated at the upper end of the trachea. A second tube, of a diameter approximately equal to that of the reduced diameter end section of the first tube is passed through the side wall of the main



body of the first tube at a location spaced longitudinally of the first tube from the shoulder. The second tube exends through the main body portion of the first tube and terminates at an open end located within the main body closely adjacent the shoulder so that a space of only relatively small volume exists within the first tube between the open ends of the two tubes. One-way check valves employing a light easily actuated valve member may be mounted at the opposite ends of the respective tubes.

3,815,607

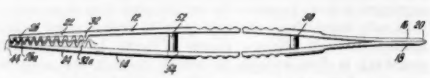
TISSUE GRIPPING SURGICAL FORCEPS

John E. Chester, Orange, Conn., assignor to Edward Weck & Company, Inc., Long Island City, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,396

Int. Cl. A61b *17/28*

U.S. Cl. 128—354 **3 Claims**



Surgical forceps for atraumatically gripping tissue during surgical procedures provides two parallel rows of teeth which interdigitate; they interlock but do not make direct contact. The rows of teeth are separated by a groove which extends into the jaw face below the base of the teeth for the reception of tissue. Elongated members have opposed faces and resilient distal ends, at which ends the members are joined. The members are biased away from each other and require a small finger pressure to move the faces into an abutting relation. When the faces are forced into the abutting relation, teeth on the proximal ends interdigitate and positively grip, but do not puncture or otherwise injure, the tissue.

3,815,608
RETAINING CATHETER

Dom Spinosa, Wantagh; Phyllis Riely, Northport, and Fred Hodgson, Centereach, all of N.Y., assignors to East/West Medical Products, Inc., Syossett, N.Y.

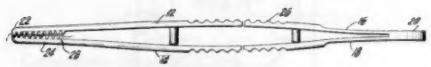
Filed Mar. 10, 1972, Ser. No. 233,500
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 R **5 Claims**

A retaining catheter formed of an inert fluorocarbon polymer and including means in the region of the end thereof for retaining said catheter within the body channel in the form of a helical thread projecting radially from the outer surface of the catheter.

3,815,609
TISSUE GRIPPING SURGICAL FORCEPS

John E. Chester, Orange, Conn., assignor to Edward Weck & Company, Inc., Long Island City, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,395
Int. Cl. A61b *1/28*
U.S. Cl. 128—354 **3 Claims**

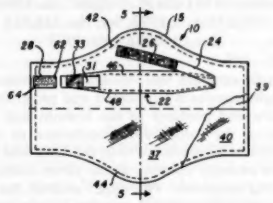


Surgical forceps for atraumatically gripping tissue during surgical procedures provides numerous rows of teeth which interdigitate; they interlock but do not make direct contact. Elongated members have opposed faces and resilient distal ends, at which ends the members are joined. The members are biased away from each other and require a small finger pressure to move the faces into an abutting relation. When the faces are forced into the abutting relation, teeth on the proximal ends interdigitate and positively grip, but do not puncture or otherwise injure, the tissue.

3,815,610
BODY-ATTACHABLE STEAM PACK COVER

Thorkil Winther, 5512 Brainard, Countryside, Ill. 60525

Filed Mar. 5, 1973, Ser. No. 338,032
Int. Cl. A61n *5/00*
U.S. Cl. 128—380 **8 Claims**

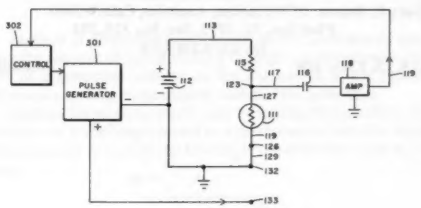


A steam pack cover adapted to contain a contoured neck steam pack and adapted to be secured about the neck of a user for applying localized moist heat thereto for therapeutic treatment purposes, includes an elongated envelope composed of fabric material for enclosing the neck steam pack, a long strap of fabric material secured at one of the end portions of the envelope and bearing a long strip of female velcro material for interlocking with a short strip of male velcro material secured to the opposite end portion of the envelope to hold the envelope in place about the neck of the wearer, and a short strip of female velcro material overlying one side of a short flap and adapted to be interlocked with the short strip on the male velcro material for protecting the male velcro material from damaging the fabric material of the envelope when the cover is not secured about the neck of a user, whereby when in use the cover is readily adjustable to fit different size users by securing the short male velcro member to any one of various different desired positions along the female member.

3,815,611
MUSCLE STIMULATION AND/OR CONTRACTION DETECTION DEVICE

Rollin H. Denniston, III, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 125,300, March 17, 1971, abandoned. This application Nov. 26, 1971, Ser. No. 202,238
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 D **12 Claims**



300

The apparatus detects contraction of muscles of living animals, the contraction causing an elastomer body whose impedance changes when flexed, positioned adjacent muscle to flex when the contraction occurs. When a bias voltage is applied to the elastomer body, any change in impedance is readily detectable. The change in impedance may produce a rhythmically repeated elecrical signal, as, for example, when the elastomer body is used to monitor heart activity. This electrical signal can be used for triggering or controlling purposes. For example, this signal can be used to control a pulse generator so that a cardioverting or pacing pulse is generated only after a specified period of time has elapsed since the latest heart activity was sensed by the elastomer body.

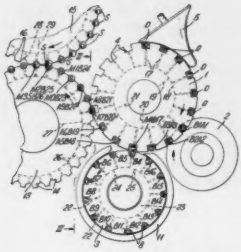
3,815,612
MANUFACTURE OF CIGARETTES

Desmond Walter Molins, London, England, assignor to Molins Limited, London, England

Filed Dec. 14, 1971, Ser. No. 207,827
Claims priority, application Great Britain, Dec. 15, 1970, 59490/70
Int. Cl. A24c *05/52, 05/58*
U.S. Cl. 131—94 **12 Claims**

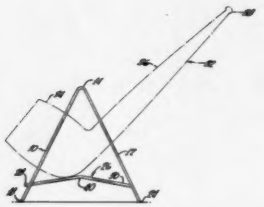
The cut-off of a continuous rod cigarette-making machine makes poorer ends at very high speeds. Therefore, double-length rods are cut off, are subdivided by a rotary knife while in a fluted drum, so producing excellent ends, are transposed so that the good ends are outermost, and are then made into mouthpiece cigarettes by inserting a double-length mouthpiece portion between them, uniting the assemblage

with an encircling band and subdividing it to produce two mouthpiece cigarettes in which the poorer quality ends are



concealed. Triple length rods may be subdivided by two rotary knives, the centre cigarettes have two excellent ends and may be used as plain cigarettes.

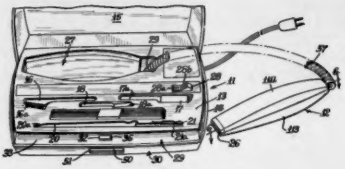
3,815,613
PORTABLE PIPE RACK
Gary E. Reavis, 1978 Catalpa, Anaheim, Calif. 92801
Filed Jan. 22, 1973, Ser. No. 325,374
Int. Cl. A24f *9/14*
U.S. Cl. 131—260 **6 Claims**



A portable smoking pipe rack of pocket size having two integrally connected legs in easel-like configuration. An enlarged aperture is located within the two legs for receiving the pipe. Positioned between the lower ends of the legs is a support member for supporting the pipe which rests in the aperture of the two legs and is received in a slot in one leg; notches on the support member locking with the ends of the slots. The support member is collapsible allowing the two legs to fold together. The portable pipe rack may be formed from a single thin sheet.

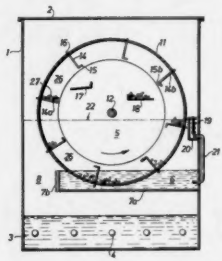
3,815,614
RECIPROCATING MANICURE DEVICE
Robert S. Waters, Oak Brook, and Albert R. Spohr, Park Ridge, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Division of Ser. No. 105,581, Jan. 11, 1971, Pat. No. 3,720,851. This application Dec. 7, 1972, Ser. No. 312,889
Int. Cl. A45d *29/20*
U.S. Cl. 132—75 **3 Claims**

A manicure device is provided which imparts reciprocating motion to a removable manicure tool. An electric motor drives a pinion gear which in turn drives a ring gear which has an integral eccentric. A tool holder is moved in a reciprocating motion by the eccentric and at its end received the manicure tool. The tool holder is guided in its reciprocating motion by means of roller bearings which ride on the inner surfaces of a hollow enclosure. A handle containing the motor and the tool holder is stored in the upper portion of a plastic



case along with the manicure tools, and the line cord is stored in a recessed enclosure that is accessible from the bottom of the case.

3,815,615
DEGREASING APPARATUS AND METHOD
Kunt Anders Holm, Skoghall, Sweden, assignor to Uddeholms Aktiebolag, Uddeholm, Sweden
Filed June 15, 1972, Ser. No. 263,206
Claims priority, application Sweden, July 22, 1971, 9447/71
Int. Cl. B08b *3/04*
U.S. Cl. 134—79 **5 Claims**

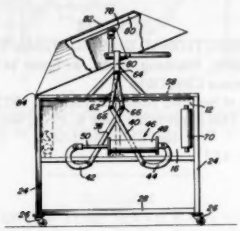


Articles are degreased by being lowered into a zone of vapour originating from a pool of boiling solvent. The vapour condenses on the articles, dissolving oil and other impurities, and the impure solvent is allowed to flow into the pool of boiling solvent. The articles are now dipped into a pool of comparatively cold solvent. Finally, the articles are lifted up into the vapour zone, and the pure solvent formed by condensation on the articles is allowed to flow into the pool of comparatively cold solvent.

3,815,616
RADIATOR CLEANING TANK
Bennie J. Stokes, 2615 Lena St., Sulphur, La. 70663
Filed Mar. 6, 1973, Ser. No. 338,514
Int. Cl. B08b *3/04, 9/00*
U.S. Cl. 134—105 **9 Claims**

An upwardly opening tank including opposite ends and a pair of upright standards supported and projecting upwardly from opposite end portions of the bottom wall of the tank disposed along the longitudinal centerline of the tank. A horizontal rack is supported within the tank and includes upstanding downwardly opening guide tubes telescopingly engaged with the standards. The upper ends of the guide tubes include laterally outwardly offset and depending support arms disposed outwardly of vertical transverse planes containing the end walls of the tank and a pair of horizontal longitudinally extending operating shafts are journaled beneath the bottom wall of the tank on opposite sides of the longitudinal centerline thereof. A pair of upstanding crossed levers are secured to

each pair of corresponding ends of the operating shafts and the upper ends of each pair of crossed levers are connected to the lower ends of the corresponding support arms of the guide tubes by means of a pair of links having one pair of lower ends pivotally connected to the upper ends of the levers and the other pair of upper ends thereof pivotally connected to the support arms. Also, one pair of corresponding ends of the shafts include crank arms carried thereby and the remote end



portions of the cylinder and piston rod of a fluid cylinder are pivotally connected to the free ends of the crank arms in a manner such that expansion of the fluid cylinder causes the upper ends of the crossed levers to be swung toward each other and contraction of the cylinder causes the upper ends of the crossed levers to swing apart, thereby raising the guide tubes or sleeves when the fluid cylinder is extended and lowering the guide tubes and rack supported therefrom when the fluid cylinder is contracted.

3,815,617

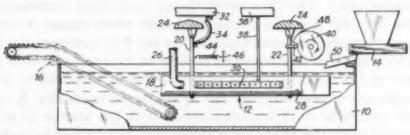
CONTINUOUS PLATING SYSTEM

Elbert R. Faust, Litchfield, Conn., assignor to The Buehler Corporation, Indianapolis, Ind.

Division of Ser. No. 120,635, March 3, 1971, Pat. No. 3,699,985, which is a continuation-in-part of Ser. No. 796,033, Feb. 3, 1969, Pat. No. 3,616,423. This application June 29, 1972, Ser. No. 267,497

Int. Cl. B08b *3/04*

U.S. Cl. 134—133 **10 Claims**



A system for the continuous plating, cleaning or rinsing of articles wherein all surfaces of the articles are uniformly and entirely exposed to the fluid through which they are conveyed. A trough suspended within a fluid bath is operative to cyclically move forward and upward and abruptly return to its initial position thereby to cause articles in the trough to inertially fall to positions successively forward of the trough and in new positions with respect to the trough and other articles.

3,815,618

METHOD AND APPARATUS FOR PRODUCING A LIQUID CONCENTRATION-VOLUME GRADIENT

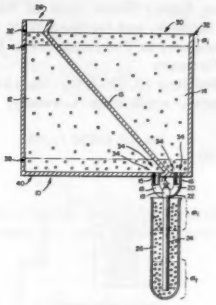
John E. Joyce, South Weymouth, Mass., assignor to International Equipment Company, Needham Heights, Mass.

Filed Feb. 8, 1973, Ser. No. 330,880

Int. Cl. B01f *5/00*

U.S. Cl. 137—1 **8 Claims**

A generator for producing a known and controllable gradient between two liquids. The generator includes two compartments which contain the two liquids from which the gradient is produced. Each compartment is provided with an outlet for flow of liquid in the compartment to a gradient forming zone. Means are provided within the generator for continuously varying the amount of liquid flowing through one compartment outlet relative to the amount of liquid flowing through the other compartment outlet.



Method of producing liquid gradients by continuously varying the amount of liquid flowing through a compartment outlet of a generator relative to the amount of liquid flowing through a second compartment outlet of the generator.

Method for washing blood cells by forcing blood cells to the bottom of a stationary liquid in a container, where the liquid has a greater density at the bottom of the container than at the top.

3,815,619

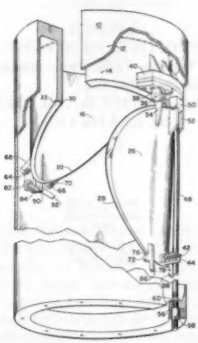
FAST ACTING VALVE

George F. Ross, and Marvin N. Swink, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Aug. 31, 1972, Ser. No. 285,400

Int. Cl. F16k *31/00*

U.S. Cl. 137—68 **9 Claims**



A fast acting valve for effecting very rapid gas-tight closure which requires only a relatively small enlargement of the outer dimensions of the pipe system. The valve employs a pivotally mounted cover plate held in the open position by a releaseable

fastening means, such as an explosive bolt, and a valve operator which applies force on the cover plate that causes it to rapidly rotate into its closed position upon release of the fastening means.

3,815,620

MEASURING AND/OR CONTROL DEVICE FOR THE SETTING OF THE CONSTITUENTS OF A CHEMICAL SOLUTION ESPECIALLY OF A GALVANIC BATH

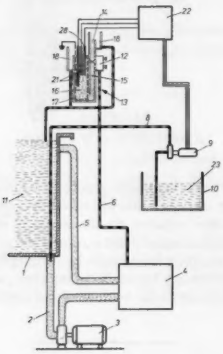
Willy Dziomba; Rainer Beule, both of Wolfsburg; Gunter Dreyer, Kl. Sissbeck, and Gerhard Wolf, Wolfsburg, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed June 18, 1971, Ser. No. 154,347

Claims priority, application Germany, June 30, 1970, 2032123

Int. Cl. G05d *11/08*

U.S. Cl. 137—90 **4 Claims**



A system for the measuring and/or controlling of the chemical characteristics of a chemical solution having predetermined chemical characteristics, the system comprising a circulating arrangement through which the chemical solution is flowing, including an analyzer having measuring and reference electrodes placed into the circulating arrangement and which provides information as to the state of the characteristics and, means for delivering additional constituents into the container to maintain the characteristics at a predetermined desired value.

3,815,621

PROPORTIONING PUMP

Art I. Robinson, Wichita Falls, Tex., assignor to Bear Mfg. Corporation, Wichita Falls, Tex.

Filed Jan. 2, 1973, Ser. No. 320,468

Int. Cl. F16k *19/00*

U.S. Cl. 137—99 **15 Claims**

A proportioning pump for combining and mixing two liquids in exacting proportions, with provisions made for automatically deactivating the pumping system if the primary liquid stops flowing or if the secondary liquid is depleted, so as to enable the liquids combined and mixed to be of the same homogenous mixture, without one or the other being increased in the mixture due to insufficient supply of either liquid. Provision is made to operate the system entirely on the pressure of the primary liquid, without the use of electricity in any form, which enables the present system to be used in hazardous areas, such as areas in which dangerous gases are present. A metering indicia is provided which enables the exact determination of the ratio of the secondary liquid to the primary liquid without test runs.

3,815,622

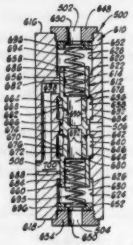
BIDIRECTIONAL DIFFERENTIAL VALVE

Thomas E. Allen, Mustang, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Division of Ser. No. 266,505, June 26, 1972, Pat. No. 3,774,401. This application June 8, 1973, Ser. No. 368,105

Int. Cl. G05d *1/00*

U.S. Cl. 137—112 **2 Claims**



An automatic control system for use with a hydraulic drive system which includes a source of pressurized hydraulic fluid and first and second hydraulic drive motors deriving their power from said source of pressurized hydraulic fluid, comprising a differential valve in fluid communication with the source of pressurized hydraulic fluid and a flow divider in fluid communication with the differential valve and with a flow compensator. The flow compensator is in fluid communication with the first and second hydraulic drive means. A compensator valve member is carried by the flow compensator for controlling the relative rates of flow of hydraulic fluid to the first and second hydraulic drive motors in response to load variations encountered by the hydraulic drive means. A control unit is in fluid communication with the source of pressurized hydraulic fluid and with the flow divider and includes a control valve member for controlling hydraulic fluid signals being sent therefrom to the flow divider. An actuator is operatively connected to the control valve member for actuating the control valve member in response to stimulus from a source external to the automatic control system. A flow divider valve member is carried by the flow divider for controlling the relative rates of flow of hydraulic fluid through the flow divider in response to the hydraulic fluid signals from the control unit.

3,815,623

MOLTEN METAL DELIVERY SYSTEM

John E. Farmer, Midlothian, Ill., assignor to Farmer Mold & Machine Works, Inc., Chicago, Ill.

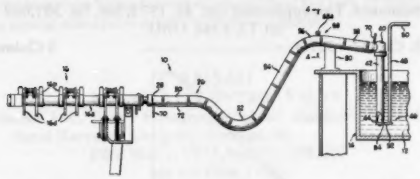
Filed Nov. 4, 1971, Ser. No. 196,472

Int. Cl. F16l *43/00*

U.S. Cl. 137—142 **7 Claims**

A molten metal delivery system comprising a molten metal dispensing station and a molten metal reservoir; and a communicating conduit therebetween. The conduit includes a

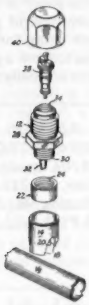
resealable closure member at the highest point intermediate the ends thereof. Another resealable closure member is provided for the lowest end of the conduit within the reservoir and dispensing or metering means may be provided at the other end.



3,815,624
COPPER TUBE SERVICE VALVE

John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 137,376, April 26, 1971, Pat. No. 3,732,886. This application Apr. 26, 1973, Ser. No. 354,820
Int. Cl. B23b *41/08;* **F16e** *41/04*
U.S. Cl. 137—318 **3 Claims**



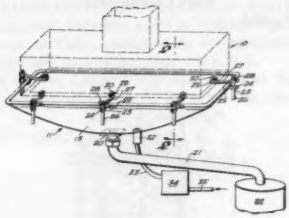
One end of a short length of copper tubing is bifurcated for connection with a line to be tapped in straddling relation. The other end of the copper tube surrounds and is connected to an internally threaded bushing. A generally cylindrical centrally bored air valve core equipped housing is threadedly connected at one end portion with the bushing. The bushing connected end of the housing is provided with a coaxial line piercing tip for piercing the line to be tapped as the housing is threadedly engaged with the bushing.

3,815,625
CLEANING RECEPTACLE FOR RESTAURANT EXHAUST HOODS

George Weise, 1462 Alps, Wayne, N.J. 07470

Filed Feb. 14, 1972, Ser. No. 225,998
Int. Cl. B08b *9/00*
U.S. Cl. 137—376 **3 Claims**

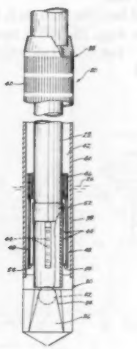
A portable, adjustable catch basin receptacle for attachment against the underside of inlet hoods of kitchen ventilating exhaust systems. Nozzle fittings are provided in association with the receptacle catch basin for supplying a liquid cleaning solvent under pressure to the hood filter and duct-work for the removal therefrom of grease, oil, dust and dirt, which drips directly into the receptacle catch basin. The catch basin is fitted with a flexible drain hose for draining dislodged and dissolved grease, etc. into a sludge container for ready disposal.



3,815,626
APPARATUS FOR THE AUTOMATIC REGULATION OF THE FLOW OF FLUID

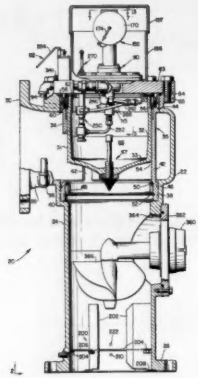
Cameron C. Bryant, 8504 Izard St., Omaha, Nebr. 68114

Filed Sept. 28, 1972, Ser. No. 292,986
Int. Cl. F16k *31/18*
U.S. Cl. 137—432 **6 Claims**



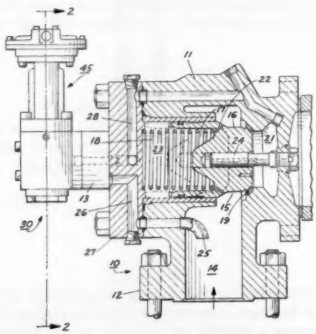
An apparatus for the automatic regulation of the flow of water is disclosed comprising a vertically disposed fluid intake pipe having a plurality of vertically spaced openings formed therein with a float means moveably embracing the intake pipe above the openings. The float is vertically moveable with respect to the intake pipe in response to changes in the level of the fluid surrounding the intake pipe. A ribbon-like seal means is secured to the float means and is moveable therewith to seal and open certain of the openings in the intake pipe responsive to the changes in the level of the fluid surrounding the intake pipe. As the level of fluid drops around the intake pipe, the seal means seals the uppermost openings in the intake pipe to prevent air being drawn thereinto.

3,815,627
VALVE ASSEMBLY
Thomas C. Farrell, Glenshaw, and Harry W. Fisher, Pittsburgh, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Dec. 19, 1972, Ser. No. 316,487
Int. Cl. G05d 7/03
U.S. Cl. 137—486 34 Claims



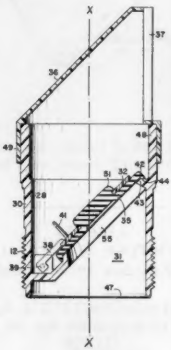
A valve assembly capable of providing a substantially constant rate of flow in a fluid system and of measuring total fluid flow.

3,815,628
PRESSURE RELIEF SYSTEM
Homer E. Ferrill, Alexandria, La., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 224,862, Feb. 9, 1972,. This application Aug. 15, 1973, Ser. No. 388,687
Int. Cl. F16k 31/12
U.S. Cl. 137—492.5 8 Claims



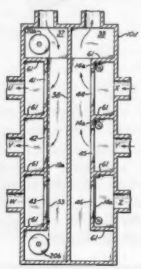
A pilot operator for controlling main valve operation to relieve overpressure from a system to which the main valve is connected. A spring biased pilot disc normally maintains the operator closed in opposition to system pressures below set pressure. On an overpressure being encountered, the disc lifts from its seat to effect main valve operation. A variably presettable adjustment in the path of disc movement regulates lift distance for effecting desired blowdown operation of the main valve.

3,815,629
SEWER RELIEF VALVE
Jene V. Oberholtzer, P.O. Box 28127, Dallas, Tex. 75228
Continuation-in-part of Ser. No. 166,094, July 26, 1971, abandoned. This application Oct. 26, 1972, Ser. No. 301,089
Int. Cl. F16k 15/03
U.S. Cl. 137—527.8 3 Claims



A sewer relief valve for installation in the cleanout connection to a sewer line, with a flapper which opens to release sewage water when water rises in the sewer line, said flapper being self-closing when the water pressure has been relieved on the line so as to seal the gases in the sewer line. The valve unit is molded of a relatively rigid plastic material with the sealing face of the flapper being formed of a softer inserted piece of nylon plastic so as to form a gas type seal to the sewer line when the valve is in the normally closed position.

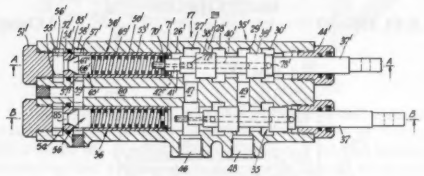
3,815,630
FLUID FLOW CONTROL VALVES
Herbert L. Barnebey, 835 N. Cassady, Columbus, Ohio 43216
Continuation-in-part of Ser. No. 218,114, Jan. 17, 1972, Pat. No. 3,773,077. This application May 7, 1973, Ser. No. 357,714
Int. Cl. F16k 3/02, 27/04
U.S. Cl. 137—594 3 Claims



This disclosure relates to a valving system for controlling the flow of fluids, particularly vapors and gases, through ports of relatively large area with relatively low pressure drops. The type of valve disclosed I call a "curtain valve"; it is comprised of an impervious flexible sheet (the curtain) movably installed to cover and uncover an opening or port on the upstream side so that the curtain seals around the edges of the port under the pressure differential across the port. To prevent deflection of the central part of the flexible sheet through the port opening a grid coextensive in area with the port opening may be provided on the downstream side, the bars of the grid being suffi-

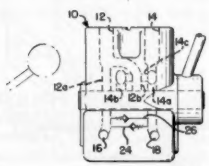
cient in number and spacing to support the flexible sheet or curtain which covers (or throttles) the port area. This disclosure relates particularly to such valving in a system of an array of several ports, the particular example selected to illustrate the invention being valving for controlling the flow of fluids in a typical adsorption system with three adsorbers.

3,815,631
HYDRAULIC CONTROL VALVE
Daniel J. C. Shaw, Elvington, England, assignor to International Harvester Company, Chicago, Ill.
Filed May 1, 1973, Ser. No. 356,273
Int. Cl. F16k *11/20*
U.S. Cl. 137—596 **4 Claims**



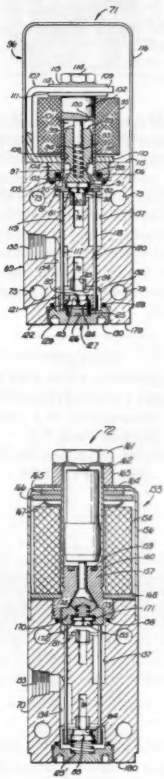
A closed centre hydraulic control system for a track-laying vehicle comprises a pair of spool valves and a pair of variable relief valves. Each spool valve controls the supply of hydraulic fluid to the clutch and brake cylinders associated with a respective one of the tracks of the vehicle and is operable in three positions: a first position in which the brake is disengaged and the clutch is engaged, a second position in which the clutch is disengaged and the brake is disengaged, and a third position in which the clutch is disengaged and the brake is fully engaged. Movement of the spool valves from the second to the third positions is effective to increase progressively the pressure at which the relief valve relieves hydraulic fluid supplied to the associated brake cylinder, so that the brakes are progressively engaged during the movement of the spool valve from the second position to the third position.

3,815,632
VALVE
George N. Bliss, P.O. Box 1, Renton, Wash. 98055
Filed Mar. 12, 1973, Ser. No. 340,202
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.24 **7 Claims**



A valve is provided with a rotatable spool which has a bypass position to bypass incoming fluid from pump directly to the tank, a forward position to direct incoming fluid to one working port and return the fluid from another working port to tank, and a third position to direct the incoming fluid in the opposite direction through the two working ports. The position of the spool can also be adjusted to provide excellent flow metering characteristics.

3,815,633
FLUID FLOW CONTROL MANIFOLDS AND DEVICES
Roger Greenwood, Valencia, and Leo William Van Bellen, Burbank, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Division of Ser. No. 230,891, March 1, 1972, Pat. No. 3,747,623.
This application Feb. 12, 1973, Ser. No. 331,630
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.27 **1 Claim**



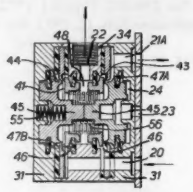
A valve manifold and a modular valve which may be used in the assembly thereof or used separately therefrom. When the valve is mounted in any one of four positions, four different combinations of functions are possible. No additional parts are required to mount the valve in any of the four positions. All valves may be identical or some may be normally open and some normally closed. Half O-ring grooves permit the use of two positions. Mounting symmetry is required in any case. Two seals permit either pneumatic or hydraulic use. Tandem operation of two valves with a single solenoid is accomplished through the use of rods slidable through the valve body. Higher pressure ratings may be achieved in alternative embodiments.

3,815,634

FLUID CONTROL VALVES

Dennis Stephen Dowdall, Morden, and Peter Ernst Dieter Price, Farnborough, both of England, assignors to Telektron Limited

Filed June 28, 1971, Ser. No. 157,314
Claims priority, application Great Britain, June 30, 1970, 31699/70; Dec. 15, 1970, 59432/70
Int. Cl. F16k 11/14
U.S. Cl. 137—627.5 1 Claim



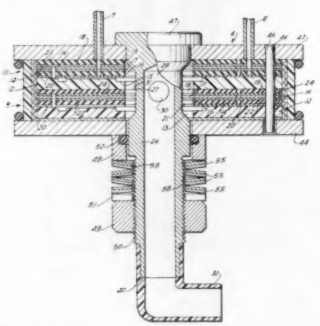
A fluid flow control valve in which communication between respective inlet, outlet and exhaust ducts is controlled by movement of an axially reciprocable spool relative to an annular sealing member co-operating with respective seat means on the spool and on the housing of the valve, in which movement of the spool in one direction first effects sealing engagement between the spool seat and the sealing member to close one line of communication, and then moves the member off the other seat means to open another line of communication. The sealing member may, for example, be a flexible diaphragm or a piston.

3,815,635

TEMPERATURE COMPENSATOR DEVICE AND FLUIDIC ASSEMBLY INCORPORATING IT

Theodore J. Jansen, Morristown, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed July 30, 1973, Ser. No. 383,929
Int. Cl. F15c 1/06
U.S. Cl. 137—833 7 Claims



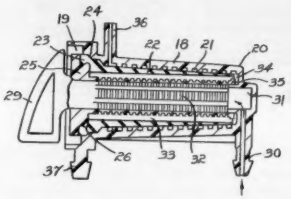
In a fluidic apparatus, annular body members are stacked between upper and lower plates. The plates and body members provide a centrally located aperture through which a manifold axially extends. The outer contour of the manifold resembles a bolt in that it includes a head and a threaded section. When the apparatus is assembled, the head abuts the upper plate and a nut engaged with the threaded section biases, via a washer and a plurality of bi-metallic washers, a spacer against the lower plate. Each of the bi-metallic washers resembles a truncated hollow cone and the metal on the concave side of the washer has a higher thermal coefficient of expansion than the metal on the convex side. Thus, if after the apparatus is assembled the ambient temperature rises causing the body members to expand, the bi-metallic washers tend to flatten out, thereby reducing pressure variations between the body members. The temperature reaction of the assembled apparatus is reversible and, therefore, the fluidic apparatus is useable over a wide range of temperatures.

3,815,636

PRESSURE REDUCING VALVE AND FLOW CONTROL DEVICE

Stanley William Otto Menzel, Torrens Park, Australia, assignor to Iplex Plastic Industries Pty. Ltd., Elizabeth, Australia

Filed June 20, 1972, Ser. No. 264,634
Claims priority, application Australia, June 23, 1971, 5288/71; Feb. 28, 1972, 8096/72
Int. Cl. F16d 1/00
U.S. Cl. 138—43 2 Claims



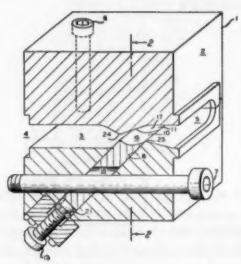
A flow control device for fluids in which an elastomeric member in contact with a body, has an elongated channel formed between body and elastomeric member with at least one wall of the channel formed by the elastomeric member, fluid being admitted to the channel at one end and allowed to flow from the other end, but the channel is so arranged that fluid fed to the channel exerts pressure on the elastomeric member to press the member to the body whereby to deform the elastomeric member to vary the cross-sectional area of the said channel in accordance with the applied pressure.

3,815,637

MEANS FOR FLOW CONTROL OF THERMOPLASTIC MATERIAL

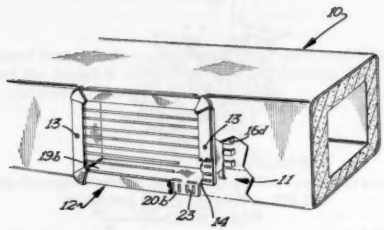
Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 847,311, Aug. 4, 1969, abandoned.
This application Oct. 4, 1971, Ser. No. 186,453
Int. Cl. B29f 3/06; F15d 1/02
U.S. Cl. 138—45 6 Claims



A means for producing a desired distribution of thermoplastic in an extrudate which involves inserting into the flow path of the extrudate prior to the die at least one flow deflector means to redistribute the flow of the extrudate in the passageway.

3,815,638
DUCT FRAME OPENING
Duane P. Martin, 3825 Edgewood Ave., Minneapolis, Minn. 55343
Continuation of Ser. No. 642,634, May 11, 1967, abandoned. This application Sept. 2, 1970, Ser. No. 69,163
Int. Cl. F16l 53/00
U.S. Cl. 138—103 2 Claims



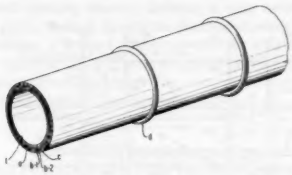
A duct opening frame, typically supplied in coil form, of flexible, bendable sheet material and adapted to be formed into a frame for attachment to low density, Fiberglas heating, ventilating and cooling ducts to provide means to receive grilles, registers and access doors on the duct.

3,815,639
CORRUGATED TUBING
Leonhard Westerbarkey, Gutersloh, Germany, assignor to Firma Westaflexwerk L. & F. Westerbarkey, Gutersloh, Zum Stillen Frieden, Germany
Filed June 5, 1972, Ser. No. 259,383
Claims priority, application Germany, June 4, 1971, 2127750
Int. Cl. F16l 11/16
U.S. Cl. 138—135 4 Claims

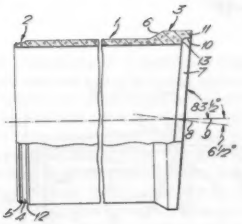
This disclosure teaches a helically corrugated two-layer tube made of strips of sheetmetal or plastic and this disclosure teaches further an apparatus and a method for manufacture of the tube. A leading and a lagging margin of an inner strip are folded over each other along the path of the helix. A leading margin of an outer strip overlaps a lagging margin thereof along a corrugation. That corrugation is pressed along with a mating corrugation of the inner strip to form a head-shaped or snap-button-shaped fold whereby the inner and outer strips are united.

3,815,640
ELONGATED PIPE TIGHTLY COATED WITH A PROJECTION-FORMED SYNTHETIC RESIN COATING
Kosuke Iida, Yohkaichi; Nobuo Kanada, and Takeji Kurita, both of Mitsu-machi, all of Japan, assignors to Takiron Co., Ltd., Osaka, Japan
Filed Jan. 13, 1972, Ser. No. 217,495
Int. Cl. F16l 9/00
U.S. Cl. 138—146 9 Claims

A synthetic resin-coated pipe suitable for supporting plants or agricultural houses is composed of an elongated rigid pipe and a synthetic resin coating tightly coated thereon having annular projections disposed at regular intervals. Said synthetic resin-coated pipe is produced by making a hollow pipe from a band steel, subjecting the pipe to chemical treatment, coating the surface of the pipe with an adhesive, and after drying the adhesive, forming thereon a synthetic resin coating having annular projections at regular intervals by means of an extruder whose cross head die includes therein a projection forming member movable reciprocably in the axial direction in the space between the die body and the top of its mandrel.



3,815,641
CONCRETE PIPE WITH SPLAYED SOCKET
Charles William Simpson, Surrey Hills, Australia, assignor to Rocla Concrete Pipes Limited, Melbourne, Victoria, Australia
Filed July 6, 1972, Ser. No. 269,422
Claims priority, application Australia, July 6, 1971, 5437/71
Int. Cl. F16l 17/02
U.S. Cl. 138—155 4 Claims

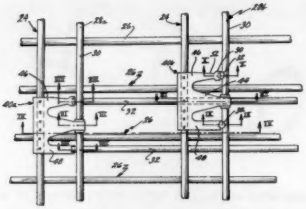


A concrete pipe for laying in bend of a pipe line. The pipe is of straight cylindrical, spigot and socket type. The socket is deliberately splayed so that socket axis is inclined at acute angle to longitudinal pipe axis to enable strong joint between successive pipes laid at angle to one another.

3,815,642
HINGE FOR HINGED STIRRUP FABRIC
Mort W. Henry, and Daniel J. Borodin, both of Detroit, Mich., assignors to New York Wire Mills Corp., Tonawanda, N.J.
Filed July 23, 1973, Ser. No. 381,478
Int. Cl. F16l 9/08
U.S. Cl. 138—175 26 Claims

Fabric for reinforcing concrete pipe and the like including stirrup members for anchoring the fabric in the concrete which are joined to the fabric by hinge means. The stirrup members are rotatable between a non-erect position generally parallel to the fabric and an erect position generally normal to the fabric. The hinge means include two cantilever arms for hingedly securing the stirrup members to the fabric, for biasing the stirrup members into the non-erect position, and for resisting any further rotation of the members once they are in the erect position. One arm lies on one side of the stirrup member and tends to bias the stirrup member into its non-erect position. The other arm lies on the other side of the stirrup member and serves as a stop when the stirrup member is

erected. As the stirrup member is erected, the first arm slides around the base of the stirrup member and its end engages the



stirrup member on the same side as the second arm, but below the axis of rotation of the stirrup member. This locks the stirrup member against rotation back to its non-erect position.

3,815,643

SHED FORMING DEVICE IN WEAVE LOOMS

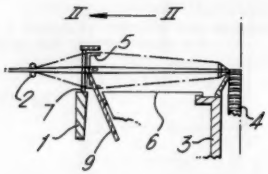
Einar Haoya; Martin Presthus, and Hans Christiansen, all of Mandal, Norway, assignors to Mandals Reberbane Christiansen & Co. A/S, Mandal, Norway

Filed Feb. 29, 1972, Ser. No. 230,354

Claims priority, application Norway, Mar. 1, 1971, 751/71

Int. Cl. D03d *37/00*; **D03c** *13/00*; **D03j** *5/02*

U.S. Cl. 139—15 **2 Claims**



A weave loom comprising a carrier of at least one longitudinally extending shuttle and one stationary reed having pins positioned in a plane extending parallelly to the direction of movement of the shuttle carrier for the purpose of leading warp threads on to the point at which a weft thread is to be introduced, and further comprising a tooth wheel which is freely turning on the shuttle carrier in front of each shuttle for the purpose of forming a warp thread shed, the freely turning tooth wheel being so mounted that the plane of the wheel is situated at an angle to the plane of the reed pins and the teeth of the tooth wheel are engaging the said pins.

3,815,644

PICKER STICK CHECK MECHANISM

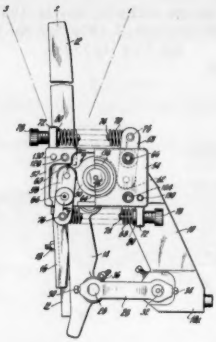
Gary Robert Skeen, Warwick, R.I., assignor to Anthony Pace and Virgina Pace, d/b/a Magnatrol Co., New York, N.Y.

Filed Nov. 13, 1972, Ser. No. 305,984

Int. Cl. D03d *49/40*

U.S. Cl. 139—162 **16 Claims**

A mechanism for controlling operation and positioning of a picker stick for a loom wherein a cam is interconnected with a picker stick member to simultaneously rotate with reciprocal pivotal movement of the picker stick. A pair of spring loaded cam followers engage the bearing surface of the cam and act as braking and positioning means controlling the picker stick during its reciprocal pivotal operating stroke. The particular



shape of the cam determines the nature of the braking and positioning action which is effected by the cam followers during the operating stroke of the picker stick.

3,815,645

MACHINE CLOTH FOR THE PAPER OR CELLULOSE INDUSTRIES

Francisco Lorente Codorniu, Halmstad, Sweden, assignor to Nordiska Maskinfilt Aktiebolaget, Halmstad, Sweden

Filed Dec. 27, 1971, Ser. No. 212,350

Claims priority, applications Sweden, Dec. 31, 1970, 17855/70

Int. Cl. D03d *1/00*; **D21f** *3/00*

U.S. Cl. 139—383 A **1 Claim**

A papermaker's cloth or a cloth for similar purposes having interlacing means at both transverse edges of the cloth in the shape of loops which, when interlocked form a continuous joint in said cloth. The locking loops are formed by weaving the weft yarns in two different layers about one or two temporary threads positioned at the edge or edges of the warp, or alternatively, at the centre thereof, whereby the locking loops will be located entierly between the upper and the lower surfaces of the weave. The loops are thereafter heat treated and the temporary thread removed. The invention also concerns a method of producing said loops.

3,815,646

INFLATABLE FUNNEL

Donald L. Coakley, 101 Washington Ave., Golden, Colo. 80401

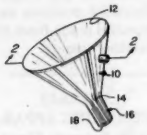
Filed Jan. 29, 1973, Ser. No. 327,498

Int. Cl. B65b *39/04*

U.S. Cl. 141—337 **7 Claims**

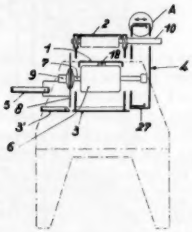
An inflatable funnel, having inner and outer funnel shaped members, formed of flexible, resilient sheet material sealed at

their tops and bottoms leaving a space therebetween for the insertion of air to inflate the funnel into semi-rigid form. The



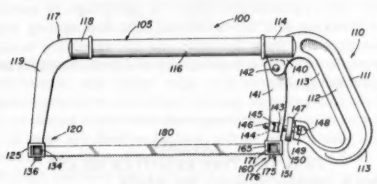
deflated funnel folds to very small dimensions, and while inflated the funnel is sufficiently rigid for directing fluid from one container to another out its smaller end.

3,815,647
WOOD WORKING MACHINE
Emile Georges Piemont, 2, rue Rabelais, 92 Vanves, France
Filed Oct. 10, 1972, Ser. No. 295,883
Int. Cl. B27c 9/04
U.S. Cl. 144—1 C **8 Claims**



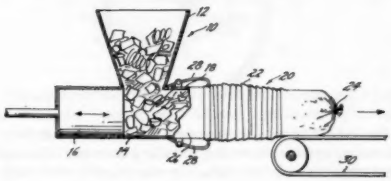
Combined wood-working machine, characterized in that the distance separating a tool-holding shaft and a tool-holding motor shaft is variable and the table of a smoothing planer supports the motor and can pivot around an axis which has a fixed height relative to the ground, the table of a saw and the table of a rough planer, form the two opposite and parallel faces of a prismatic block being displaceable in a direction perpendicular to the table of the smoothing planer.

3,815,648
BLADE HOLDER
Raymond C. Dreier, Chicago, Ill., assignor to Dreier Brothers, Inc., Chicago, Ill.
Filed June 21, 1973, Ser. No. 372,176
Int. Cl. B27b 21/06
U.S. Cl. 145—33 A **10 Claims**



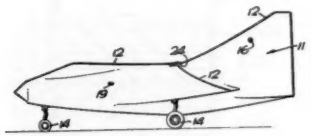
A blade holder for a handsaw construction for holding a saw blade having an aperture in one end thereof, the handsaw construction including a longitudinally extending saw frame having a handle at the rear end thereof and a front leg at the front end thereof and a rear leg intermediate the front leg and the handle, tensioning means for moving the blade carrying end of one of the legs away from the other of the legs and a blade holder fixedly carried by one of the legs for securing thereto the one end of the saw blade. The blade holder includes a first clamping member having a slot therein providing a first guide surface and a second guide surface for receiving and orienting the saw blade therebetween, the first guide surface having an elongated opening therein defining a stop member and the second guide surface having an opening therein overlying the stop member, a second clamping member rotatably mounted in said opening in said second guide surface and having a finger extending therefrom for cooperation with said stop member to maintain a saw blade in the slot.

3,815,649
CARTRIDGE PACK FOR TRASH COMPACTION MACHINE
John Kenneth Delmar, Havertown, Pa., assignor to Crystal-X Corporation, Darby, Pa.
Continuation-in-part of Ser. No. 61,693, Aug. 6, 1970, Pat. No. 3,650,298. This application Jan. 17, 1972, Ser. No. 218,349The portion of the term of this patent subsequent to Mar. 21, 1989, has been disclaimed.
Int. Cl. B65d /00
U.S. Cl. 150—1 **6 Claims**



A cartridge comprising a compressed plastic tube for mounting on the tapered end of a hollow cylindrical member into which solid waste or refuse is rammed so that the tube can subsequently be tied and cut into relatively small units containing slugs of compacted refuse. The plastic tube comprises external folds generally about 20 in. in length which extend in the same direction, alternate ones of the folds being separably secured intact or in their folded condition by heat sealing or adhesive means so that after a length of tube, such for example as 33 ft., is filled with compacted refuse, the heat sealing or adhesive means of the alternate folds can be readily pulled open and the thus unfolded folds tied and severed between the ties to form smaller plastic containers of compacted refuse.

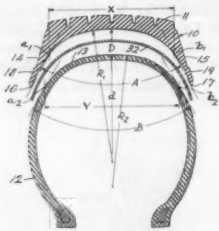
3,815,650
PROTECTION OF AIRCRAFT
Christopher Daniel Dowling Hickey, 5 Heathside, Hinchley Wood, England
Filed June 22, 1972, Ser. No. 265,354
Claims priority, application Great Britain, June 25, 1971, 30010/71
Int. Cl. B65d 37/00
U.S. Cl. 150—52 R **11 Claims**



An envelope made wholly or partly of flexible impermeable material, and adapted to enclose an aircraft, there being an access opening in the envelope, the envelope including a re-usable airtight fastener, operable to close and seal the opening

against ingress of air into the envelope, the envelope also having apertures through which wheels of an aircraft can protrude, together with sealing means for sealing said apertures to parts of the aircraft's undercarriage, and valve means controlling an outlet for air from the interior of the envelope whereby suction may be applied to and maintained within the envelope to collapse said envelope into closely fitting engagement with the aircraft.

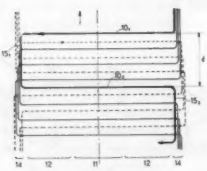
3,815,651
REPLACEMENT TREAD AND METHOD
Duward Harding Neal, Muncie, Ind., assignor to Tred-X Corporation, Muncil, Ind.
Filed July 13, 1972, Ser. No. 271,350
Int. Cl. B60c *11/02*
U.S. Cl. 152—187 **2 Claims**



The invention is a replacement tread for installation on a tire casing and the method of installing the tread. The replacement tread includes an endless, pre-molded central tread portion having a relaxed diameter less than the inflated diameter of the tire casing. Integral shoulder wings extend downwardly from the central tread portion and define a circular bottom edge. The shoulder wings bias the bottom edges against the tire casing effecting a seal.

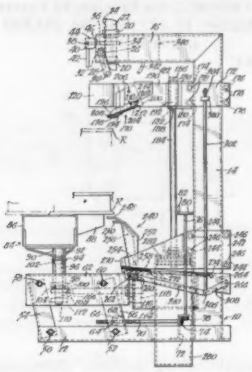
To install the replacement tread, the tread area of the tire casing is prepared and the tire casing inflated. The replacement tread is expanded and released onto the tire casing. Tension forces hold the replacement t read closely against the tire casing. The tread is stitched under pressure forces to remove entrapped air and to effect a flud seal etween the shoulder wings and the tire casing. Finally, the replacement tread and the tire casing assembly is cured or bonded.

3,815,652
TIRE WITH FLEXIBLE CORD CARCASS CONSTRUCTION AND METHOD OF MAKING SAME
Jacques Pouilloux, Saint Gratien, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France
Filed Apr. 5, 1972, Ser. No. 241,290
Claims priority, application France, Apr. 5, 1971, 71.12015
Int. Cl. B60c *9/08*, *15/04*; **B29h** *17/28*
U.S. Cl. 152—356 **32 Claims**



A tire and method of making the same, according to which the tire possesses a radial carcass formed at least within the sidewalls by meridian arcs from pliable cord; the arcs which are spaced circumferentially are constituted from one and the same continuous flexible cord or from a small number of such cords while circumferenial portions extend longitudinally and alternatively on one and on the other side in the beads whereby the circumferential portions are juxtaposed in the form of longitudinal bundles made from strand material which constitutes the bead reinforcements.

3,815,653
TIRE CHANGING APPARATUS
Ray A. Scott; Fredrick R. Bossard; Elmer J. Strang, and John L. Mikovits, all of Fort Dodge, Iowa, assignors to The Coats Company, Inc., Fort Dodge, Iowa
Filed Sept. 11, 1972, Ser. No. 288,154
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.24 **13 Claims**

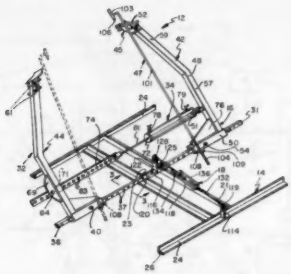


A tire changing apparatus adapted for use with a large variety of tires on rims having varying diameters and internal opening shapes and sizes. The apparatus includes a frame having a horizontal portion and a vertical portion with a tire and rim supporting table mounted for generally horizontal movement and for rotational movement about a generally vertical axis. The horizontal movement is in the direction of the vertical frame portion and the latter in turn mounts upper and lower bead breaking assemblies having a common actuator for moving the two towards each other to break both beads when a tire is on the table. Also included is a combination mounting and demounting tool which may be employed in connection with rotation of the table for mounting or demounting a tire on a rim. The apparatus provides the advantage of permitting bead breaking and tire mounting and demounting without removing a rim from the table and the capability to change tires on rims having a large variety of diameter widths and internal opening sizes.

3,815,654
TRACTOR TIRE REMOVER MEANS
Reuben E. Maddox, Glasgow, Mo. 65254
Filed Aug. 22, 1972, Ser. No. 282,846
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.26 **7 Claims**

This invention relates to a portable tractor tire remover means which can be readily assembled and disassembled for ease of handling and movement and having power means which may be connected to the conventional power take-off structures on farm work implements such as tractors. More particularly, this invention is a tire remover means operable

under fluid power to remove the tire from the rim of a tire structure having actuator arms movable towards each other to



release the tire in a most efficient and effective manner and including adjustable means so as to be readily utilized on tires of all sizes.

3,815,655

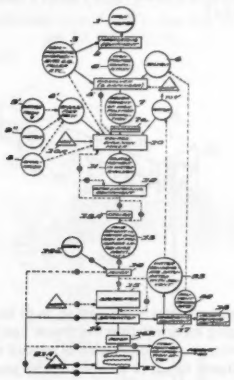
AQUEOUS LATICES OF HIGH POLYMER COMPOSITIONS AND MEANS FOR PRODUCING SAME

Oliver W. Burke, Jr., Fort Lauderdale, Fla., assignor to Esso Research and Engineering Company, Linden, N.J.

Division of Ser. No. 691,823, Dec. 19, 1967, which is a continuation-in-part of Ser. No. 621,997, March 7, 1967, Pat. No. 3,503,917. This application Nov. 4, 1969, Ser. No. 870,734

Int. Cl. B01d *47/00, 47/10, 47/06;* **C10j** *1/12;* **B01d** *1/14*

U.S. Cl. 159—16 S **2 Claims**



The preparation of aqueous latices from solvent dispersions of elastomers and other high polymer compositions has presented problems including foaming and coagulation which have produced losses and increased costs. Herein combinations of steps are disclosed which reduce or eliminate various of these problems; enable the preparation of latices from high solids, high viscosity cements; enable preparation of latices of filler extended and filler reinforced elastomers; and enable the preparation of latices both dilute and of high solids content, which are useful for example for adhesive and film forming purposes. The process is particularly characterized, inter alia, by the establishment of a flow of latex through the separating zone and the impingement on said flow of the coalesced latex droplets from the solvent vapor stream in which they are delivered to the separator, and in certain embodiments by the use of particular emulsifier combinations. New combinations of apparatus are also disclosed and claimed for performing the steps of the process. The process disclosed is applicable to the production of latices from specified rubbery and non-rubbery polymers, which may contain reinforcing filler, and certain of such latices are new and useful products also claimed herein.

3,815,656

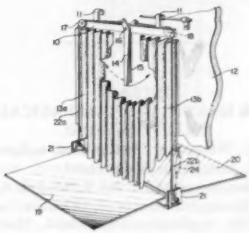
TREADLE-ACTUATED CLOSURES

Leslie Z. Kober, Springfield, and Maurice C. Bailey, Fairfax, both of Va., assignors to Log Etronics Inc., Springfield, Va.

Filed Sept. 13, 1972, Ser. No. 288,833

Int. Cl. A47h *1/00*

U.S. Cl. 160—123 **8 Claims**



A closure structure (e.g., curtains, doors, blinds, etc.) is actuated between "open" and "closed" positions by a foot-operated treadle assembly operatively connected to one or more pivotally mounted actuating arms which engage the closure elements. The treadle assembly includes a toggle latch mechanism which controls its operation e.g. to permit the closure elements to open and then close upon a single actuation and release of the treadle, or to permit the closure elements to open and then close, or vice versa, in response to successive actuations of the treadle respectively, and/or to adjust the quiescent position of the closure structure in its open or semi-open position. The overall system may comprise a support bar having drapes depending therefrom, adapted to be mounted adjacent the top of a door frame, cooperating with a treadle and associated toggle latch mechanism positioned at floor level in or adjacent said door frame and coupled to the actuating arm or arms mounted on the support bar by simple cord or cable linkages.

3,815,657

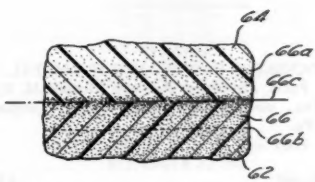
OVERHEAD GARAGE DOOR SECTIONS

Walter K. Malek, Hinckley, and Henry Substelny, Cleveland, both of Ohio, assignors to Architectural Molded Products Ltd., Richfield, Ohio

Continuation-in-part of Ser. No. 70,839, Sept. 9, 1970, abandoned. This application Nov. 10, 1971, Ser. No. 197,213

Int. Cl. E04b *2/10*

U.S. Cl. 160—229 **10 Claims**



An articulated closure comprising a plurality of hingedly connected sections adapted to be positioned adjacent a structural opening is provided. The sections cooperate to define reversible closure surfaces facing opposite sides of the struc-

tural opening. Each of the sections is integrally formed of a closed-cell, rigid polyurethane foam which provides a central core substantially enclosed within an integrally connected, substantially continuous skin of increased density. According to one aspect of the invention, the section further includes a case structure which is integrally molded with the low density core and has a relatively higher density. The case is chemically and mechanically bonded to the core at an interface zone having a higher average density than the core and the case so that the interface zone serves as an inner reinforcement for the section. According to another aspect of the invention, the case is provided with reinforcing means substantially embedded therein and comprising a net-type structure or randomly oriented glass fibers. In addition, methods of forming such sections are provided.

3,815,658

PROCESS FOR MAKING A METALLURGICALLY SLOW REACTING MOLD

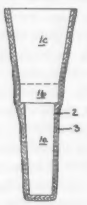
Hans Schneider, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Continuation-in-part of Ser. No. 9,265, Feb. 6, 1970, abandoned. This application Apr. 3, 1972, Ser. No. 240,531

Claims priority, application Switzerland, Mar. 13, 1969, 3776/69

Int. Cl. B22c *9/04*

U.S. Cl. 164—35 **7 Claims**



The mold is made by initially dipping a pattern into a mixture of pulverized magnesium carbonate and colloidal hydrolyzed silicic acid to form a number of layers thereon. The green mold is then burned for a length of time and at a temperature to cause the formation of forsterite (Mg_2SiO_4) whereby the active magnesium oxide (MgO) formed during burning completely bonds in the silicic acid. The silicic acid cannot then detrimentally effect the precision casting of steels or alloys having a high chromium, titanium and/or aluminum content, especially at high casting temperatures.

3,815,659

PROCESS FOR CASTING MOLTEN METAL

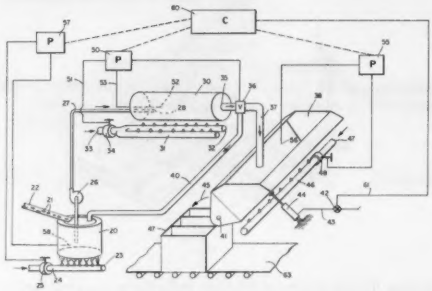
William A. Pavlo, Fleetwood, Pa., and Richard M. Conroy, Dallas, Tex., assignors to General Battery Corporation, Reading, Pa.

Filed Sept. 29, 1972, Ser. No. 293,461

Int. Cl. B22d *27/16*

U.S. Cl. 164—65 **9 Claims**

It is herein provided to mold castings of articles, such as battery grids, in accordance with a technique for permitting the molten metal to have a higher lead content, by raising the temperature of the melt at the point of molding, or substantially thereat, but not significantly prior thereto. Accordingly, the metal is initially heated to a desired liquid conveying temperature, and, on its path of delivery to a ladle, from which it will



be poured for casting, the melt is superheated, or boosted up to the desired temperature, either in a single stage, or in two stages.

3,815,660

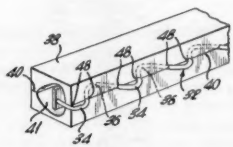
IMPROVED METHOD FOR CASTING METAL TENNIS RACQUET

Peter Christopher John Gallagher, and Gerald R. Kotter, both of Hightstown, N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Aug. 9, 1972, Ser. No. 279,166

Int. Cl. B22d *19/02*; **A63b** *49/12*

U.S. Cl. 164—112 **4 Claims**



A metal tennis racquet is die cast so as to incorporate independent stringing means within the frame head. The stringing means may comprise a multiplicity of spaced eyelets partially cast into the frame head, or a sinuous wire annulus of spaced and alternating crests and troughs, the troughs being cast into the frame head and the crests receiving the racquet string. Either form of stringing means may be connected to a metal band of the same general size and shape as the frame head, which band is cast into the frame.

3,815,661

PROCESS FOR REDUCING OXIDE DEFECTS IN INVESTMENT CASTINGS

Patrick M. Curran; Geoffrey R. Brazer, both of Manchester, and John S. Erickson, Colchester, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

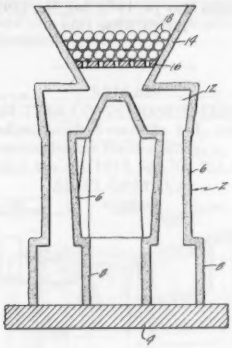
Filed Sept. 21, 1972, Ser. No. 291,126

Int. Cl. B22c *9/08*

U.S. Cl. 164—134 **8 Claims**

In casting alloys that are prone to the formation of dross such as single or complex oxides of one or more of the metals

making up the alloy or crucible, such dross is filtered out by a ceramic filter positioned in the filler for the mold. More



specifically, oxides formed in the melt are removed by a filter made up of ceramics formed from metal oxides since the oxides have a tendency to adhere to each other.

3,815,662

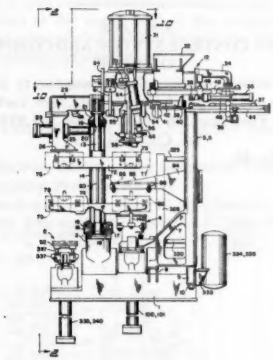
JOLT TABLE SHAPED FOR SUPPORTING COPE TOP AND TELESCOPING INTO DRAG

Leon F. Miller, Rocky River; Henry J. Herbruggen, Westlake, and Robert G. Shields, Chagrin Falls, all of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 672,063, Oct. 2, 1967, Pat. No. 3,589,432. This application Apr. 5, 1971, Ser. No. 131,528

Int. Cl. B22c *15/30*

U.S. Cl. 164—203 **5 Claims**



A foundry molding machine utilizing a match-plate and two sets of rubber lined cope and drag slip flasks with two stations; one station assembling one set of flasks with the matchplate therebetween and then rolling over the flask-match-plate assembly to fill the drag with sand while supporting the assembly on the cope and jolting and applying a low pressure preliminary squeeze to the sand within the drag, rolling the assembly back to fill the cope and then supporting the assembly on the sand within the drag for the application of jolt and high pressure squeeze to the sand in both the cope and drag.

3,815,663

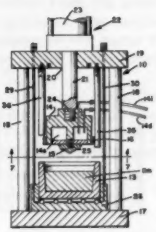
DIE CASTING APPARATUS

John L. O'Connor, 3020 Curran Rd., Louisville, Ky. 40205, and Joseph L. Newman, Louisville, Ky., assignors to said O'Connor, by said Newman, Louisville, Ky.

Filed Feb. 18, 1972, Ser. No. 227,383

Int. Cl. B22d *17/04*

U.S. Cl. 164—321 **16 Claims**



The present invention provides improved apparatus for casting dies and the like. Basically, the apparatus comprises a container for holding molten material that is to be cast into an article, such as a die or the like, having a cavity of a desired shape formed therein; a plunger mounted for movement into and out of the container and mounting an embossed master of the desired cavity shape that can be impressed into the molten material; and seal means mounted around the outer periphery of the plunger to provide a fluid-tight seal between the plunger and the interior of the container. The seal means has a coefficient of expansion which is greater than that of the container and plunger and has a melting point which is greater than that of the material to be cast.

3,815,664

EXPANSIBLE FRAME HOT TOPPING APPARATUS

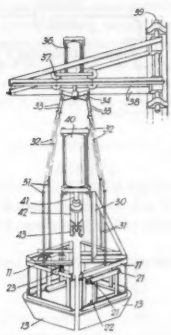
Kenneth Thomas Eccleston, and Roger Fieldhouse, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

Filed June 7, 1972, Ser. No. 260,439

Claims priority, application Great Britain, June 16, 1971, 28244/71

Int. Cl. B22d *45/00*

U.S. Cl. 164—339 **6 Claims**



Hot topping apparatus comprises an expansible frame for applying lining slabs to the mould or head box walls, and a holder for refractory wedges, the holder being moveable to drive the wedges between the slabs to secure the lining in position.

3,815,665

CASTING MOLD AND BASIN-LIKE RISER THEREFOR

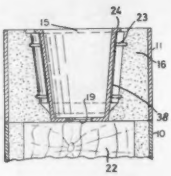
Eduard Baur, P.O. Hommerich, Waldbrugh near Lindlar, Germany (5256)

Filed Sept. 12, 1972, Ser. No. 287,317

Claims priority, application Germany, Sept. 15, 1971, 2146031

Int. Cl. B22c *9/08*

U.S. Cl. 164—359 **28 Claims**



In combination with a casting mold there is provided a riser or basin-like funnel communicating with a top region of the mold cavity for after-feed of molten metal to the top region of a solidifying casting; the riser, either open-topped or closed-topped, being shielded against radiant and conduction heat loses by surrounding hollow space and/or thermal radiation or conduction insulating material; also including a knock-off groove-providing formation for riser excess metal resulting on the casting.

3,815,666

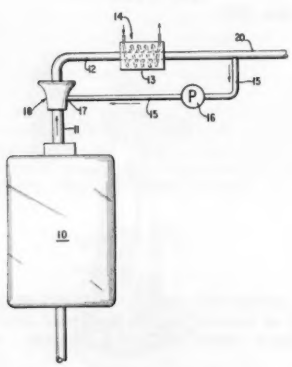
CLOSED LOOP GAS COOLING

Frederick W. Roberts, Southport, and Virgil D. Drummond, Fairfield, both of Conn., assignors to Rolock Incorporated, Fairfield, Conn.

Filed Dec. 30, 1971, Ser. No. 213,890

Int. Cl. F28f *13/06*

U.S. Cl. 165—1 **2 Claims**



An apparatus and a process for producing generated gas wherein the generated gas is cooled and then a portion recirculated into the generated gas as it leaves the generator. Such serves to rapidly cool the generated gas so as to inhibit or prevent formation of solid carbon particles and preventing change of chemical analysis.

3,815,667

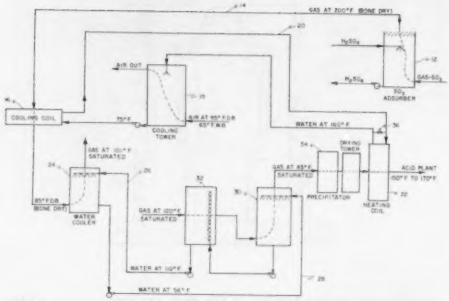
HEAT EXCHANGE PROCESS AND APPARATUS

Ted R. Brown, 1212 Princeton Ave., Salt Lake City, Utah 84105

Division of Ser. No. 172,968, Aug. 19, 1971, abandoned. This application May 14, 1973, Ser. No. 359,803

Int. Cl. F28c *1/00*

U.S. Cl. 165—2 **11 Claims**



Heat exchange process and apparatus for efficiently reducing the temperature of a liquid or gas for beneficial use. One embodiment illustrating the invention comprises treating sulfur dioxide-containing saturated gas so that the water content of the saturated gas is lowered enough to accommodate formation of highly concentrated sulfuric acid. The process includes adiabatically cooling water or other liquid by passing dry gas through the liquid to nearly saturate the gas and cool the water to near the entering wet bulb temperature of the gas. The cooled water is then used to scrub sulfur dioxide-containing saturated gas to reduce its temperature. When the water content of the sulfur dioxide-containing gas has been reduced and the gas transferred out of the presence of moisture, heat exchangers may be used to adjust the temperature of the sulfur dioxide-containing gas prior to transfer to the acid plant.

3,815,668

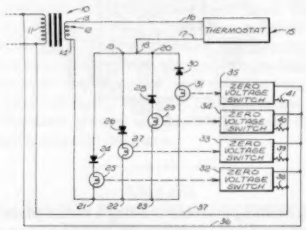
COMFORT CONTROL SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 29, 1973, Ser. No. 345,899

Int. Cl. G05d *23/30*

U.S. Cl. 165—26 **5 Claims**



A system for heating and/or cooling utilizing a new two-wire thermostat and/or a zero voltage switch. Plural stages of heating and/or cooling may be provided with a single two-wire thermostat. That is, the sensor may be a dual automatic changeover thermostat. The heat control signal may be positive. The cool control signal may then be negative. Diodes are employed to pick the control signals by their polarities. The zero

voltage switch inhibits firing of a triac unless the A.C. input voltage is near crossover. Three embodiments of zero voltage switches are disclosed. One provides pulsed crrrent to limit the heat output of an electric heating element. Another provides, e.g. a two minute inhibit signal to prevent a cooling system compressor from being turned on immediately after it has been turned off. This is desirable to protect the cooling system from damage.

3,815,669

MULLION BUTTER CONDITIONING COMPARTMENT

Robert E. Lindenschmidt, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 23, 1973, Ser. No. 353,455
Int. Cl. G05d *23/19*
U.S. Cl. 165—30 **10 Claims**

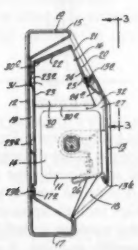
Refrigeration apparatus having a butter conditioning and storage compartment in a separator wall that separates the above freezing refrigerated compartment from the below freezing storage compartment with the butter compartment arranged to receive refrigeration from the above freezing compartment together with heating means for heating the butter compartment to a desired conditioning and storage temperature. The disclosure also includes the provision of auxiliary heating means for the butter compartment operating in conjunction with condensate preventing heating means normally provided at the outer shell of the refrigerator in the vicinity of the separator wall that separates the above freezing and below freezing compartments.

3,815,670

STREAMLINED DIFFUSER PLATE FOR A BASEBOARD HEATER

Charles S. Shriver, Oreland, Pa., assignor to Orbit Manufacturing Company, Perkasie, Pa.

Continuation-in-part of Ser. No. 119,563, March 1, 1971, Pat. No. 3,714,982. This application Dec. 4, 1972, Ser. No. 311,765
Int. Cl. F24h *9/04*
U.S. Cl. 165—55 **14 Claims**



A baseboard heater having a housing with finned tubing mounted in an air flow path between a cool air inlet extending along the base of the housing and a hot air outlet extending along the top of the housing is provided with a streamlined diffuser plate having a series of apertures extending along the length of the outlet. A series of vanes are mounted to the diffuser plate for dividing the interior of the housing into a series of plenums corresponding in number to the apertures with a plenum in registry with an aperture. A preferred form of vane has a lower edge which overlies the finned tubing in closely spaced relation and a pair of curved legs diverging outwardly and upwardly in V-fashion from the lower edge and toward the edges of adjacent apertures. The vanes operate to improve the operational cleanliness of the heater by streamlining the flow of air through the heater. Other forms of vanes are also disclosed.

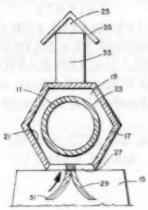
The present invention relates to basboard heaters, and more particularly, the present invention relates to baseboard heaters having means for altering the flow pattern of hot air as it exists from the heater to improve the operational cleanliness of the heater.

3,815,671

PIPELINE FORCED AIR CONVECTIVE HEAT TRANSFER SYSTEM

Jerry Brent Turner, 17203 Central Pk., Hazelcrest, Ill. 60429

Filed Dec. 5, 1972, Ser. No. 312,290
Int. Cl. F24h *3/00*
U.S. Cl. 165—47 **16 Claims**



A system using air for removing heat from a pipeline laid in permafrost areas has an insulated duct-like member encircling an elevated section of the pipeline with an annular air flow space therebetween and at least one top outlet and one bottom inlet thereto. The outlet and the inlet are spaced apart along the longitudinal axis of the pipeline. An air deflector is positioned to deflect air into the inlet thereby increasing natural convective air forces arising inside the convective heat transfer system. The insulation standoff distance, the ratio of the inlet-to-annular space areas of flow, and the spacing between inlet and outlet ports are set for maximum advantage. Additional advantage is obtained by using an elongated outlet stack.

3,815,672

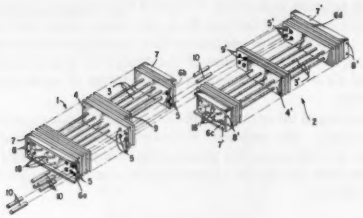
SPLIT FIN HEAT EXCHANGE UNIT

Russell H. Bullard; Robert M. Lloyd, and David B. Zipser, all of Wilmington, Del., assignors to The Singer Company, New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,695
Int. Cl. F28f *1/32*
U.S. Cl. 165—151 **5 Claims**

A heat exchange unit comprises a series of parallel tubular finned leg portions connected with U-shaped bends to form a continuous path for the circulation of a heat exchange fluid. The unit is formed of two joined sections, each of which is provided with an offset portion. In the construction of the unit, hairpin tubing is employed in each section; however, straight tubes extend through at least the longitudinally aligned offset portion of each section. The method of constructing the unit comprises expanding the hairpin tubes of each section into

heat conducting engagement with the fins thereon by a single stroke multi-tube expander device, juxtapositioning both sections in side-by-side relationship, inserting the straight tubes through at least the offset portions of the sections, separately



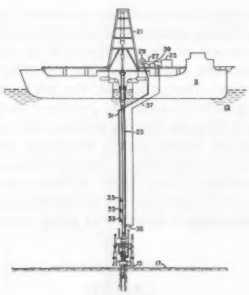
expanding the straight tubes into heat conducting engagement with the fins thereon, and providing return bends on the open ends of the straight tubes and on selected open ends of the hairpin tubing to provide the desired circulation path for the heat exchange fluid.

3,815,673

METHOD AND APPARATUS FOR CONTROLLING HYDROSTATIC PRESSURE GRADIENT IN OFFSHORE DRILLING OPERATIONS

George H. Bruce, and William T. Ilfrey, both of Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Feb. 16, 1972, Ser. No. 226,843
Int. Cl. E21b 7/12
U.S. Cl. 166—0.5 **2 Claims**



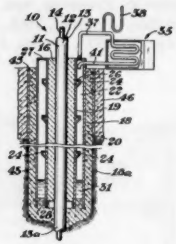
An improved system for offshore drilling is disclosed which is particularly useful in those operations where a floating vessel is situated at the surface of a body of water and circulation of drilling fluid is accomplished by introducing drilling fluid into a drill string extending from the vessel into a borehole in the floor of the body of water and returning it through a separate conduit to the vessel. A surface detectable signal is generated which is proportional to the hydrostatic head exerted by the drilling fluid within the return conduit. Hydrostatic head of the drilling fluid within the return conduit is controlled in response to the signal, as by injecting gas into the conduit near its lower end, to regulate the hydrostatic head of the fluid in the borehole.

3,815,674

WELL STRUCTURE AND METHOD FOR PROTECTING PERMAFROST

John S. Best, 4121 Oak Court, Midland, Mich. 48640, and John Larry Duda, 602 N. Holmes, State College, Pa. 16801

Division of Ser. No. 210,037, Dec. 20, 1971, Pat. No. 3,771,590, which is a continuation-in-part of Ser. No. 112,634, Feb. 4, 1971, abandoned. This application Feb. 16, 1973, Ser. No. 332,924
Int. Cl. E21b 43/24
U.S. Cl. 166—57 **6 Claims**



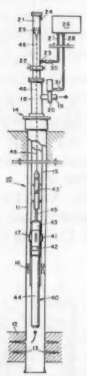
Permafrost about a bore, such as an oil well is protected by surrounding the casing of the well with an insulating layer, surrounding the insulating layer with a hollow jacket, the jacket containing liquid boiling below the freezing point of the permafrost. The boiling liquid being condensed adjacent the upper portion of the jacket and the liquid returned downwardly in the jacket.

3,815,675

WIRELINE OPERATED SUBSURFACE SAFETY VALVE

Beldon A. Peters, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed May 22, 1972, Ser. No. 255,629
Int. Cl. E21b 33/03, 43/12
U.S. Cl. 166—72 **24 Claims**

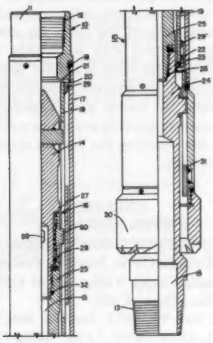


A subsurface safety valve system for controlling the flow of production oil and/or gas fluids through a well pipe. The valve assembly is installed in the well pipe a predetermined depth below the surface. A wireline connects the valve assembly to surface facilities which include apparatus for maintaining sufficient tension on the wireline to hold the valve assembly to permit the valve assembly to close. A valve element closes off flow of fluids through the valve assembly by upward movement of a valve element actuator, the same direction as the upward flow of the production well fluids.

3,815,676
INDEXING EQUALIZING VALVE FOR RETRIEVABLE WELL PACKER

Norman W. Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 16, 1972, Ser. No. 298,107
Int. Cl. E21b *23/00*
U.S. Cl. 166—226 15 Claims



A mandrel having a central flow passage and a pair of ports at the uppermost end of the flow passage terminating in the central portion of the mandrel has a pair of reference pins spaced 180° apart near the uppermost end of the mandrel. A sleeve valve having a pair of indexing pins spaced 180° apart near the center of the sleeve and having a pair of ports spaced 180° around the sleeve is rotatably attached around the mandrel in a matching relationship to the ports in the mandrel. The lower end of the mandrel is threadedly connected to a connection member which is threadedly engaged to a gudgeon coupling assembly which in turn is threadedly engaged to the uppermost end of a well packer.

A running tool attached to the lower end of a tubing string has a freely rotating tubular indexer with a pair of indexing slots spaced 180° apart which are adapted to first engage the reference pins. Each of the indexing slots has an initial channel running parallel to the longitudinal axis of the indexer and a second channel running oblique to the first channel, the oblique channel then communicating with a third channel running parallel to the longitudinal axis of the indexer and offset from the first channel by 90° around the circumference of the indexer. As the tubing string is further lowered, the indexing slots in combination with the reference pins prevent further rotation of the indexer and also engage the indexing pins on the sleeve valve, thus causing the sleeve valve to rotate and the ports in the mandrel to be aligned with the ports in the sleeve, whereby the pressures below and above the packer are equalized. The gudgeon coupling assembly threaded into the well packer is engaged with a jay slot assembly carried by the running tool to manipulate the packer.

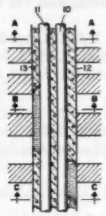
As the tubing string is lifted, the reference pins prevent rotation of the indexer, thus causing the sleeve valve to rotate to the closed position.

3,815,677
METHOD FOR OPERATING IN WELLS

Eugene S. Pennebaker, Jr., Corpus Christi, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Mar. 3, 1972, Ser. No. 231,686
Int. Cl. E21b *33/13*, *47/00*
U.S. Cl. 166—253 19 Claims

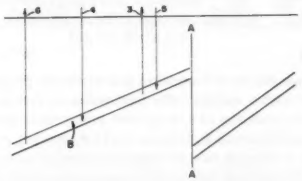
Primary cement channels formed in the cement surrounding the tubing or pipe strings are located and, thereafter, remedial or repair operations are conducted. In multiple tubingless oil and/or gas wells cement channels formed in the cement are revealed by comparing neutron logs run in each pipe string of the multiply completed well. Comparing each of the neutron logs with an open hole sonic log aids in identifying the cement channels. A series of oriented density log scans of the well bore defines the location and areal extent of the cement channels in more detail. In both single and multiple completions an oriented density log, suitably calibrated to measure apparent density, may be used alone to locate and define channels in the cement. Log interpretations and field examples are presented.



3,815,678
HYDROCARBON SWEEP PROCESS

Ruel C. Terry, Morristown, N.J., and John A. Sutherland, Houston, Tex., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 7, 1971, Ser. No. 177,978
Int. Cl. E21b *43/24*
U.S. Cl. 166—272 4 Claims



This invention relates to a process for freeing hydrocarbons, especially heavy or immobile hydrocarbons (such as undriven hydrocarbons, for example those of high viscosity and gravity), from underground formations. More particularly, this invention relates to a process for bringing to the earth's surface hydrocarbons trapped in an underground formation, as, for example, hydrocarbons remaining in the formation after primary recovery therefrom, and even after a water-flooding process has been accomplished in said formation, as a result of introduction into the formation of hot water at a point or points downstream from the producing well or wells.

3,815,679
SECONDARY OIL RECOVERY PROCESS USING BETA-SUBSTITUTED ACRYLAMIDE POLYMERS

James F. Blanke, Minneapolis, Minn., and Charles A. Christopher, Jr., Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,705
Int. Cl. E21b *43/22*
U.S. Cl. 166—275 5 Claims

An improved secondary recovery process which comprises injecting a viscous aqueous solution containing a beta-substituted acrylamide polymer, which can be partially hydrolyzed, if desired, into a subterranean oil-containing reservoir via an injection well, forcing the solution through the formation and recovering oil via a production well.

3,815,680
METHOD FOR FRACTURING AND PROPPING UNCONSOLIDATED AND DILATANT SUBTERRANEAN FORMATIONS

Lindell V. McGuire, and Derry D. Sparlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

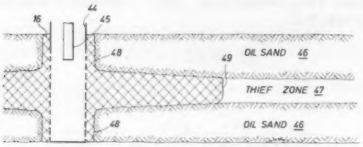
Continuation of Ser. No. 135,438, April 19, 1971, abandoned. This application Mar. 8, 1973, Ser. No. 339,480
Int. Cl. E21b *33/138, 43/26*
U.S. Cl. 166—281 **10 Claims**

An improved method for fracturing and propping unconsolidated and dilatant subterranean formations, the improvement comprising the addition of a tackifying agent to the fracturing fluid.

3,815,681
TEMPORARILY PLUGGING AN EARTH FORMATION WITH A TRANSIENTLY GELLING AQUEOUS LIQUID

Edwin Allen Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 256,507, May 24, 1972, abandoned, which is a division of Ser. No. 62,931, Aug. 11, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 354,965
Int. Cl. E21b *33/138, 43/26, 43/27*
U.S. Cl. 166—281 **10 Claims**

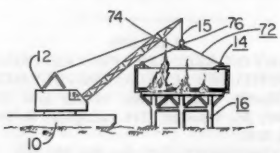


A permeable earth formation is temporarily plugged by contacting it with a substantially homogeneous liquid mixture of an aqueous solution of a metal that precipitates as a gel-forming gelatinous metal hydroxide, a pH-increasing reactant that reacts at a selected rate to cause the precipitation, and a pH-decreasing reactant that reacts at a selected slower rate to subsequently dissolve the precipitate.

3,815,682
FIRE SMOTHERING AND OIL CATCHING APPARATUS FOR USE WITH OFFSHORE OIL RIGS

Randall J. Chiasson, 808 Jefferson St.; Ronald G. Bourg, 114 Thoroughbred Dr., and Tilton J. Arceneaux, 1514 Lynn Ave., all of Thibodaux, La.

Filed Dec. 28, 1971, Ser. No. 212,998
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 R **8 Claims**

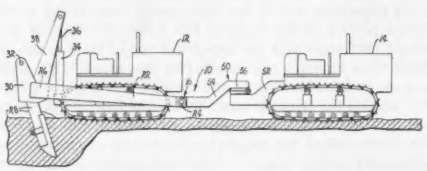


A cover with depending nesting sides, the upper parts of which telescope into a lower part. The cover and sides adjoining are lined with refractory material. Intermediate the lining and the cover a sprinkler system is mounted to provide a descending spray of cooling and fire extinguishing material. The apparatus is adapted to be lifted by its lower part with upper parts telescoped therein by a floating crane and lowered by cables over a burning off-shore oil rig and such like to enclose it from top to below sea level. Vertical adjustable jacks are mounted to depend from said cover and engage the top of the working platform of an oil rig to space it from said platform and support the apparatus when it is fully extended downward. The sides, extending below sea level, define an enclosed reservoir area for catching liquid pollutants. A conduit is mounted in the lower part of said sides, an end of which is supported at sea level in the reservoir area, and another end of which extends outwardly of the sides for discharging liquid pollutants in said reservoir area to salvage barges brought alongside. The telescoping sides are roller bearinged between sides and at corners to provide non-frictional and non-jamming operation. A hatch and depending ladder are mounted in the cover to provide access to work platform after fire is smothered for repairing the rig and stopping the flow of oil to the reservoir area.

3,815,683
RIPPER ASSEMBLY

Henry A. Collin, Jr., Cutler; James O. Eaton, Reedley; Henry A. Collin, III, Orange Cove; Jacob R. Pretzer, Merced, and Donald H. Stroot, Castro Valley, all of Calif., assignors to Agristruction, Inc., Orosi, Calif.

Filed Nov. 15, 1972, Ser. No. 306,797
Int. Cl. A01b *59/00, 13/08;* **B62d** *55/00*
U.S. Cl. 172—677 **5 Claims**

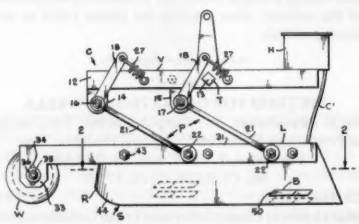


An improved ripper assembly for deep-ripping materials such as hardpan and the like characterized by a drawbar for supporting a plurality of ripper shanks, said drawbar being of a U-shaped configuration and including a pair of leg segments extended along opposite sides of a pusher tractor, and a transverse base segment integrally related to said legs and forming a pull bar mounted on the pusher tractor in a forward disposition, and linkage coupling the drawbar with a puller tractor, whereby the pusher and puller tractors concurrently apply horizontally directed forces to said drawbar for driving said shanks through the material.

3,815,684
MINIMUM TILLAGE TOOL

John H. Smith, R.R. 3, Box 96, Jonesville, La. 71343

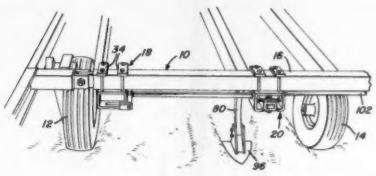
Filed July 28, 1972, Ser. No. 276,120
Int. Cl. A01b *15/00*
U.S. Cl. 172—694 **10 Claims**



The specification disclosures a minimum tillage tool for performing the final pre-planting tillage of prepared soil. Such

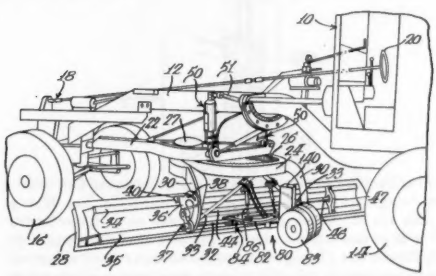
tool includes a row capping blade for cleaning and shaping the top of a row and a pair of side forming blades for cleaning and shaping the lateral sides of the row. The side forming blades have lateral extending trail ends for urging soil and vegetation away from the sides of the row as it is formed. In one embodiment, a plurality of pivoted laterally extending blades are provided for pulverizing the soil forming the row to prepare it for planting.

3,815,685
TORSION BAR CLAMP
Edwin A. Seifert, Jr., Rt. 1, Belgrade, Mont. 59714
Filed Nov. 27, 1972, Ser. No. 309,938
Int. Cl. A01b *35/24*; **F16f** *1/14*
U.S. Cl. 172—711 **3 Claims**



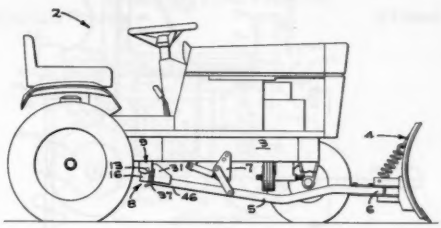
A mounting structure for support from an implement frame and including first and second brackets supported on the frame in transversely spaced relation and the first bracket includes an anchor portion oscillatably supported therefrom for rotation about an axis extending between the brackets. The anchor portion includes structure for anchoring one end of an implement therefrom and an elongated torsion bar extends between the brackets and has one end thereof supported from the second bracket for adjustable angular positioning about the longitudinal axis of the torsion bar, the second end of the torsion bar being keyed to the anchor portion for oscillation therewith.

3,815,686
ROAD GRADER BLADE SUPPORT
Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Co., Inc., Blair, Nebr.
Filed Dec. 4, 1972, Ser. No. 311,850
Int. Cl. E02f *3/12*
U.S. Cl. 172—783 **6 Claims**



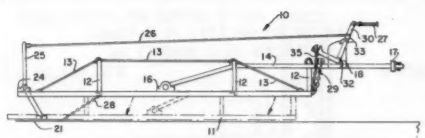
A road grader blade support attachment including a frame, means for securing the frame to a vertically adjustable blade carrier on the grader, a tongue having a front end pivotally mounted on the frame to swing about a vertical axis, an axle carrying ground-engaging blade support wheels, and means mounting the axle for vertical adjustment on the trailing end of the tongue including a piston and cylinder device having a lower end connected to the axle and an upper end connected to the tongue.

3,815,687
HITCH ASSEMBLY
Joseph A. Federspiel, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.
Filed Nov. 6, 1972, Ser. No. 303,890
Int. Cl. E02f *3/76*; **A01b** *51/00*; **B60d** *3/00*
U.S. Cl. 172—801 **8 Claims**



Presented is a tractor implement push arm hitch useful for connecting the push arms of a bulldozer blade, for instance, to the frame of a tractor. The hitch assembly is designed to automatically lock when the implement arms are raised into a predetermined position, and means are provided for effecting purposeful unlatching of the implement arms when it is desired to remove them from the assembly.

3,815,688
SNOW GRADER
Newton W. Brown, Hyde Park, Vt. 05665
Filed Oct. 1, 1971, Ser. No. 185,750
Int. Cl. E02a *3/12*
U.S. Cl. 172—789 **1 Claim**

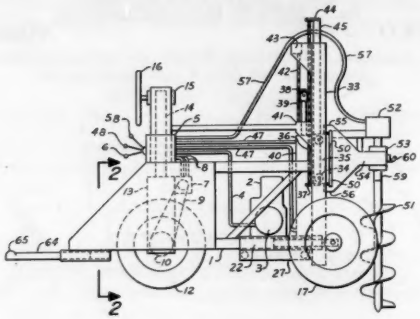


This invention relates to a snow grader comprising a support frame, a plurality of baffle means attached to said frame with the bottom thereof being in substantially the same plane as the bottom of said frame, runners movably mounted on said frame, and means for moving said runners to and from a position above the bottom of said frame to a position therebelow, said baffles being substantially parallel to each other and positioned at 90° to the direction of travel of the grader.

3,815,689
POWER DIGGER FOR LANDSCAPE GARDENERS
Ronald David Kuhl, 14075 W. Poe Rd., Bowling Green, Ohio 43402
Filed Apr. 25, 1973, Ser. No. 354,340
Int. Cl. E21c *1/10, 11/02*
U.S. Cl. 173—27 **3 Claims**

A highly maneuverable power driven implement for digging holes, such post holes or shrubbery planting holes, or lifting loads is arranged with a compact chassis having a steerable power driven rear wheel, a pair of laterally adjustable front wheels projecting ahead of the forward end of the chassis, and a vertical guide at the forward end of the chassis along which a

hydraulic auger drive motor is reciprocally movable. A motor driving a variable displacement hydraulic pump selectively



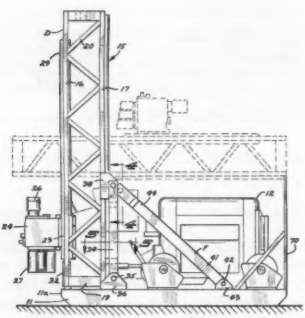
supplies power to the hydraulic auger motor, the rear drive wheel motor, and a hydraulic cylinder that reciprocates the auger drive.

3,815,690

ADJUSTABLE MAST FOR DRILLING APPARATUS

Jamshed Rustom Cooper, Minneapolis, Minn., assignor to Longgear Company, Minneapolis, Minn.

Filed Nov. 13, 1972, Ser. No. 306,016
Int. Cl. E21c 11/02
U.S. Cl. 173—44 **24 Claims**



Drilling apparatus that includes a skid mounting a mast assembly, an engine, and control assembly, the mast assembly including a derrick section, a drill head and drill head motor mounted on the derrick section for reciprocal movement relative thereto, and support members pivotally mounted on the skid for selectively supportingly retaining the derrick section in a vertical drilling position, an inclined angle hole drilling position and a horizontal transport position. One of the support members is attached to the derrick section for selectable slidable movement relative thereto and is connectable to the drill head carriage to facilitate moving the derrick section between different angular positions relative the horizontal.

3,815,691

ROTARY DRILLING APPARATUS

Albert P. Richter, Jr., Houston, Tex.; James D. Bruner, Englewood, Colo.; Roy P. Mazzagatti, Bellaire, and Hugh E. Hall, Jr., Huntsville, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 219,052
Int. Cl. B06b 1/00
U.S. Cl. 175—56 **14 Claims**

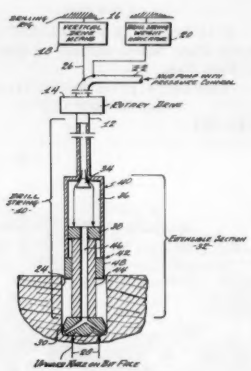
Apparatus adapted to be mounted in a rotary drilling drill string. It encompasses an acoustic discontinuity so located relative to the bit as to enhance or inhibit longitudinal vibrations of the bit during drilling operations.

3,815,692

HYDRAULICALLY ENHANCED WELL DRILLING TECHNIQUE

Robert F. Varley, Metairie, La., assignor to R. F. Varley Co., Inc.

Filed Oct. 20, 1972, Ser. No. 299,235
Int. Cl. E21b 3/00
U.S. Cl. 175—65 **9 Claims**



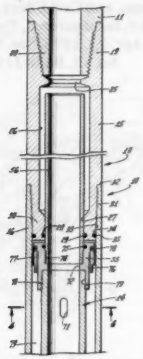
A method for drilling a well bore hole using a drill string which includes an extensible hydraulic cylinder and piston section located above the drill bit. The drill string is positioned such that the extensible section is in less than a fully extended condition while pressurized fluid is pumped into the extensible section to produce hydraulic forces tending to extend that section. The hydraulic force thus generated within the extensible section influences the effective drill string weight applied to the drill bit and thus controls the force actually exerted between the drill bit and the bottom of the bore hole.

3,815,693

VACUUM HYDRASTATIC JAR ACCELERATOR

Wayne N. Sutliff, and Jim L. Downen, both of 2931 Pierce Rd., Bakersfield, Calif. 93308

Filed June 28, 1972, Ser. No. 266,977
Int. Cl. E21b 27/00, 1/10
U.S. Cl. 175—232 2 Claims



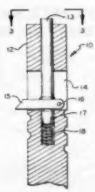
A deep well energy storage tool for accelerating the action of a hydraulic jar providing a vertically shiftable piston on said tool and applying upwardly thereto, incidental to the tensioning and tripping of the jar, the hydrastatic pressure of a column of liquid occupying the drill string, while said piston is exposed to a vacuum thereabove.

3,815,694

TOOL FOR DRILLING A LEDGED HOLE

John Giustino, 2200 Hallandale Blvd. "E", Hallandale, Fla. 33009

Filed Jan. 4, 1973, Ser. No. 321,005
Int. Cl. E21b 9/26
U.S. Cl. 175—289 1 Claim



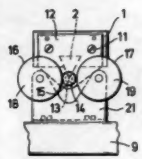
The tool has a cylindrical body with a shank adapted to fit in a drill and, adjacent its other end, has a rectangular slot therethrough from side to side at its center. In the slot, a rectangular blade is pivotally mounted at one end so as to be moveable from a position disposed diagonally and completely in the slot to a transverse position with the cutting end of the blade projecting from the slot. An axially extending push-rod has one end projecting from the body end and its other end adapted to push the blade to its projecting position. Axially aligned with the push-rod is a spring pressed plunger biasing the blade to its slot contained position. A hole is first drilled conventionally in a concrete or other ceiling, the tool is then inserted in the hole and rotated and, when the push-rod meets the closed end of the drilled hole, pushes the blade for grinding a ledged hole in which a toggle-type fastener may be engaged.

3,815,695

SCALE BEAM BEARING

Josef Schwarz, Balingen/Wurttemberg, Germany, assignor to Bizerba-Werke Wilhelm Krant KG, Balingen/Wurtt, Germany

Filed Sept. 11, 1973, Ser. No. 396,191
Claims priority, application Germany, Sept. 12, 1972, 2244639
Int. Cl. G01g 21/08; F16c 11/00
U.S. Cl. 177—261 8 Claims



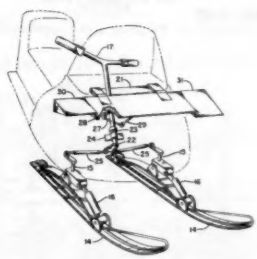
A balance lever of a weighing scale has a knife edge which rests on a seat so that the lever can pivot about a pivot axis defined by the knife edge. A rolling element is mounted on the balance lever and has a central axis about which it turns as the balance lever pivots. An adjusting arrangement permits the position of the rolling element to be adjusted transversely of the pivot axis until the axes coincide. A guide arrangement engages the rolling element at opposite sides of its central axis for preventing transverse movement of the rolling element and knife edge relative to the seat.

3,815,696

SNOWMOBILE BANKING MECHANISM

Francis Paul Larive, and Calvin Arthur Larive, both of 702 Happy Hollow, Hot Springs, S. Dak.

Filed Feb. 15, 1973, Ser. No. 332,632
Int. Cl. B60f 39/00; B62d 37/02
U.S. Cl. 180—5 R 6 Claims



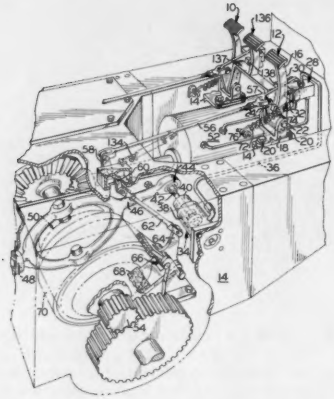
A snowmobile of the endless tread type is provided with a turning and banking as well as direct run assembly comprising a spoiler joined forwardly of the operator to the chassis of the snowmobile and in positon generally over the front skiis with the spoiler member having aileron portions cooperatively joined to the steering mechanism of the snowmobile for movement in accordance with the steering movement of the skiis. The angle of the spoiler to the horizontal is adjustable to increase or decrease the pressure of the skiis on the snow.

3,815,697

STEERING CLUTCH AND BRAKE CONTROL SYSTEM

John W. Bridwell, Peoria, and Robert Casey, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 1, 1972, Ser. No. 285,926
Int. Cl. B62d 11/00
U.S. Cl. 180—6.2 11 Claims



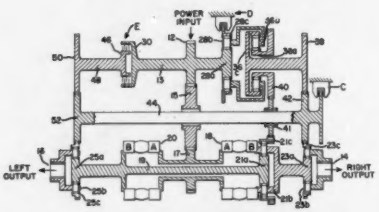
A steering system for track-type vehicles wherein a foot pedal actuates a hydraulic valve to signal a hydraulic motor to disengage a steering clutch and wherein the same pedal, after actuating said valve, physically bears upon the valve housing to mechanically cause engagement of a corresponding steering brake means. The foot pedal is biased towards a normal rest position by means of two springs having different spring rates, such that initial movement of the pedal requires only light force whereas subsequent movement requires a greater force.

3,815,698

HYDROMECHANICAL STEERING TRANSMISSION

Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company

Filed Apr. 20, 1972, Ser. No. 245,961
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 12 Claims



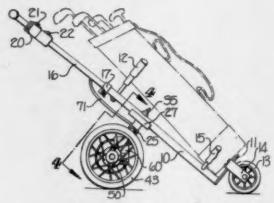
The invention provides a hydromechanical drive and steering transmission wherein power applied to the input of the transmission is utilized for hydraulic drive and steer in forward and reverse of a first range, and combined hydraulic drive and mechanical drive are utilized in a second higher range, wherein steer remains a function of the hydraulic portion of the transmission. Contribution of the hydraulic portion of the transmission to output in second range is effected through a planetary steer differential coupled to a first and second hydraulic motor unit of the hydraulic portion of the transmission. The disclosure also includes the application of an optional hydromechanical third range.

3,815,699

PORTABLE MOTORIZED GOLF CART

William F. Ganskopp, and Carl Edney, both of Tryon, N.C., assignors to Gan-Ed, Incorporated, Tyron, N.C.

Filed Apr. 23, 1973, Ser. No. 353,327
Int. Cl. B62d 51/04
U.S. Cl. 180—11 6 Claims



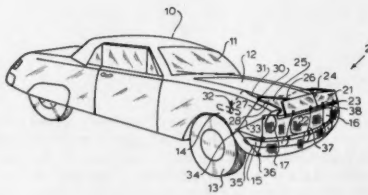
The cart is lightweight and portable and may be easily disassembled for transporting from one place to another and easily assembled for use. The cart includes an elongate control frame and a drive frame which is removably connected to the control frame and carries an electric motor and a battery for driving the cart in front of the user so that the cart may be used in pacing the walking speed of the user. The control frame includes a front guide wheel for supporting the front portion of the cart so that it may move along unattended by the user except for changing direction. The two drive wheels may be easily moved to a free wheeling position so that the cart may be easily pushed or pulled by the user in case of battery failure or the like.

3,815,700

VEHICLE INSECT PROTECTION APPARATUS

Theodor H. Mittendorf, RR No. 1, Box 102, Tavares, Fla. 32778

Filed Nov. 13, 1972, Ser. No. 306,171
Int. Cl. B60j 1/20; B60k 11/04
U.S. Cl. 180—68 P 8 Claims



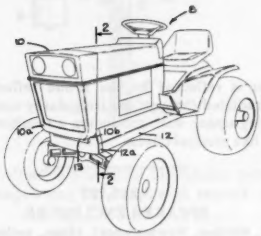
An insect protection apparatus for protecting moving vehicles from insects having a deflector shield for attachment to the front end of a vehicle for deflecting air currents and insects from the windshield of the vehicle and also including a screen attached to the deflector portion for covering an additional portion of the front end of the vehicle to catch insects to prevent the insects from hitting the front end of the car and getting into the vehicle radiator.

3,815,701

HOOD PIVOT FOR DETACHABLY CONNECTING A TRACTOR HOOD TO A TRACTOR FRAME

Roger D. Mayhew, Fredonia, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 5, 1972, Ser. No. 299,549
Int. Cl. B62d 25/12
U.S. Cl. 180—69 C 9 Claims



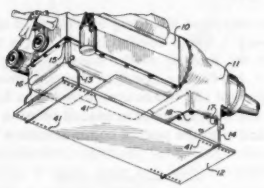
A hood pivot bracket secured to the front end of the frame of a garden and lawn tractor is used to allow ready attachment and detachment of the tractor hood to or from the tractor frame. The lower front end of the hood is pivotally retained by the bracket and can be swung forward about the bracket to an angular position wherein the hood can be pulled forward to detach the hood from the bracket and frame.

3,815,702

AUTOMOTIVE DRIP PAD ASSEMBLY

Reuben R. Paananen, 4847 Townley, Glendale, Ariz. 85301

Filed Oct. 12, 1972, Ser. No. 297,084
Int. Cl. B62d 25/20
U.S. Cl. 340—15.5 R 2 Claims



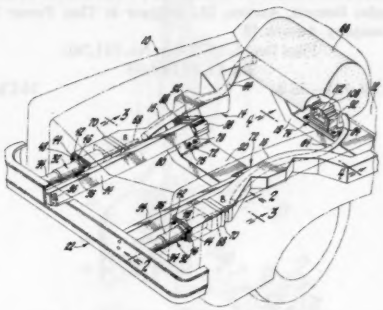
A drip pad assembly adapted for semi-permanent attachment to an automobile to catch oil and grease leaks from the engine and transmission comprises a generally rectangular pad consisting of a lower oil-impermeable sheet and an upper oil-absorbent layer. Rigid, generally U-shaped brackets support the front and rear ends of the pad. The upright members are adapted for attachment, respectively, to oil pan mounting bolts and to transmission case bolts. The length of the upright members of the supporting brackets is adjustable. The pad is provided with a plurality of mounting holes along both side edges. The brackets are provided with upstanding stud members to engage the mounting holes to locate the pad on the support brackets.

3,815,703

AUTOMOTIVE VEHICLE

John Z. De Lorean, Bloomfield Hills, and Brook A. Lindbert, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1972, Ser. No. 315,082
Int. Cl. B60n 21/00
U.S. Cl. 180—91 7 Claims



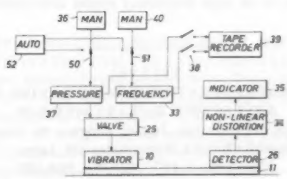
An automotive vehicle includes a frame structure including frame rails connected by cross frame members. An impact bar is supported on the forward portions of the frame rails by energy absorption struts of the type including a piston movable within a displaceable fluid medium contained in a cylinder to thereby absorb low level impact forces. A pair of rigid members extend from the impact bar through guides secured to one of the cross frame members. The engine of the vehicle power plant is secured to the rigid members to connect the engine to the impact bar for sliding movement relative to the frame. The transmission of the power plant is slidably mounted in a similar manner on another cross frame member so that the power plant and impact bar receive the impact forces as a unit and the struts absorb such forces up to their absorption limit. The frame rails may also include controlled deformation regions for absorption of higher level impact forces. The vehicle may also include a source of pressure fluid released to inflate an occupant restraint when the impact forces exceed the limit of absorption by the frame.

3,815,704

METHOD FOR DETERMINING OPTIMUM SEISMIC PULSE

Elmer Eisner, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1972, Ser. No. 317,915
Int. Cl. G01v
U.S. Cl. 340—15.5 R 8 Claims



Disclosed is a method for determining the optimum amplitudes at discrete frequencies for a seismic input pulse and for providing an input control to a seismic energy generator. In a vertical oscillatory seismic generator, the amplitude of the seismic input is a function of the frequency of the generator and the character of the ground. At an on site location, for

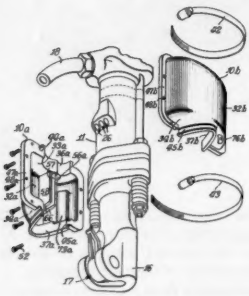
each discrete frequency, the maximum undistorted amplitude is determined and recorded. The recorded and correlated optimized amplitude and frequency are used to drive a seismic generator vibrator at optimum seismic energy input conditions.

3,815,705

MUFFLER FOR A PNEUMATIC PERCUSSION TOOL

Douglas Bennett, Aurora, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Filed Dec. 4, 1972, Ser. No. 311,760
Int. Cl. F01n *1/08*
U.S. Cl. 181—36 A **16 Claims**



A muffler for attenuating the sounds generated by the operation of a pneumatic percussion tool is disclosed, wherein the muffler is formed in two, symmetrically-shaped halves to facilitate mounting and demounting from the body of the tool. When mounted on the tool, the muffler surrounds a portion of the tool body including the exhaust ports and includes two expansion chambers and elongated passage means arranged in series flow relation. The first and second expansion chambers are arranged on opposite sides of the tool body and are defined in part by the outer surface of the body. A first orifice means having a predetermined area relationship with respect to the area of the exhaust ports, interconnects the first and second expansion chambers. A second orifice means having a predetermined area relationship with respect to the effective flow area of the first orifice means, interconnects the second expansion chamber with the elongated passage means. The exhaust air flow from the tool expands into the first expansion chamber, and undergoes successive expansions as it proceeds through the second expansion chamber and elongated passage means before discharging into the atmosphere. The sound level of the flow is thus attenuated as it expands and changes direction while passing through the muffler. The material of the muffler is an elastomer, which renders it durable and also contributes to its high frequency sound attenuating characteristics.

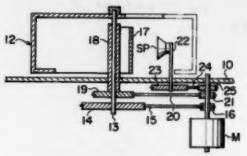
3,815,706

TREMOLO GENERATING DEVICE HAVING SOUND REFLECTING ROTARY MEMBER

Yohei Nagai, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 4, 1973, Ser. No. 366,689
Claims priority, application Japan, June 8, 1972, 47-57251
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—31 B **9 Claims**

A sound effect generating device for use in an electronic musical instrument comprises a speaker, and a rotary member having a sound reflecting curved wall and a sheltering upper wall spreading over the sound reflecting wall, the sheltering upper wall having an irregularly cutout portion. The rotary member is rotatable adjacent to the speaker, bringing the sound reflecting wall periodically in confronting relationship with respect to the speaker, whereby the sound emitted from



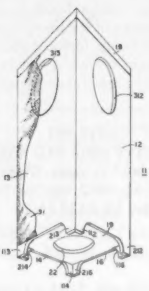
the speaker is reflected by the sound reflecting wall and thereafter radiated through the irregularly cutout portion of the sheltering upper wall, producing a resultant complicated tremolo or like musical effect.

3,815,707

SPEAKER ENCLOSURE

Winslow N. Burhoe, Newburyport, Mass., assignor to Epicure Products, Inc., Newburyport, Mass.

Filed Dec. 8, 1972, Ser. No. 313,456
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—199 **4 Claims**



A speaker enclosure including an elongated upright hollow housing having a sound reinforcing port in a bottom panel thereof with the interior of the housing being substantially unobstructed between a speaker element mounted in the upper part thereof and the bottom panel. The housing is supported with the bottom panel in spaced relation to a supporting surface and with the port in communication with ambient air.

3,815,708

SURVEY INSTRUMENT TOWER

Alfred F. Lambert, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Mar. 22, 1973, Ser. No. 343,794
Claims priority, application Canada, Apr. 14, 1972, 139692
Int. Cl. G01c *15/00*
U.S. Cl. 182—129 **9 Claims**

A lightweight survey instrument tower of the type having an inner instrument supporting structure and an outer operator supporting structure. The instrument supporting structure comprises a tubular member which is secured against rotation by a radius arm at the base. Adjustably attached to the operator supporting structure is one or more yoke assemblies comprising a number of filaments which tangentially contact the

outer side of the tubular member to provide resilient lateral support and damping for the instrument supporting tubular

member while effectively isolating the tubular member from the operator supporting structure with respect to angular deflection.

3,815,709

LUBRICATING DEVICE

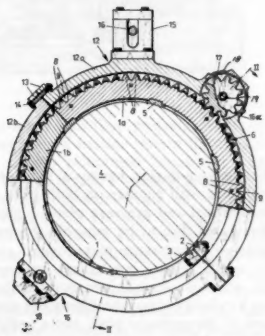
Eric Rosenthal, Hochdahl, Germany, assignor to G. Schwartz & Co., Dusseldorf, Germany

Continuation of Ser. No. 170,830, Aug. 11, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,883

Claims priority, application Germany, May 12, 1971, 2123557

Int. Cl. F16n 7/40

U.S. Cl. 184—6.28 **8 Claims**



A lubricating device, especially for rolling mills, with a fluid pump including a gear ring and pinion means in mesh therewith while a radially divisible hub is connected to the gear ring which latter at the tooth spaces thereof has radially extending feeding bores leading into tap bores, the pinion means being journalled in radially divisible housing means, the hub and the housing means being movable relative to each other.

3,815,710

SEISMIC SENSING APPARATUS

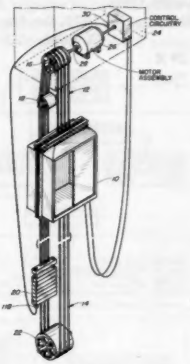
William M. Shrum, Miraleste, Calif., assignor to Maxton Manufacturing Company, Los Angeles, Calif.

Filed Oct. 21, 1971, Ser. No. 191,281

Int. Cl. B66b 1/00

U.S. Cl. 187—29 R **4 Claims**

Sensing circuitry to protect an elevator car from striking a dislodged counterweight or other structure wherein a seismic sensor is coupled through control circuitry to control the directional movement of the car. Upon the seismic sensor detecting a seismic or other disturbance of predetermined mag-



nitude, with the car located adjacent to or above the counterweight only continued upward movement is permitted, and with the car located adjacent to or below the counterweight only continued downward movement is permitted.

3,815,711

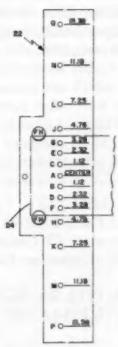
VANE LOCAL CONTROL SYSTEM FOR ELEVATORS

William R. Hoelscher, La Mesa, Calif., assignor to Elevator Corporation, Spring Valley, Calif.

Filed Feb. 8, 1973, Ser. No. 330,494

Int. Cl. B66b 1/40

U.S. Cl. 187—29 R **6 Claims**

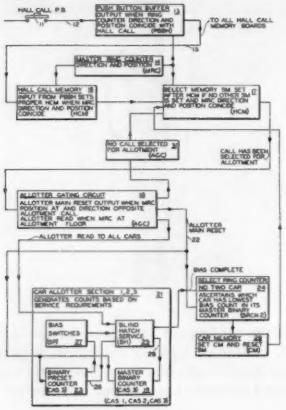


A system for controlling the approach or departure of an elevator cab to a floor level. The system utilizes a sensor array of solid state photocells and light emitting diodes to detect the presence of a vane. The vane is positioned to indicate the landing floor level. The sensors are arranged to function in conjunction with a logic system whereby the distance to the floor will be indicated with either direction of approach. The logic system enables multiple use of one or more of the sensors. The signals from the logic system are utilized in conjunction with an electronic motion control system for elevators to command the appropriate velocity at each incremental distance. Upon reaching the immediate vicinity of the floor level, a floor hold system is activated which accomplishes the micro-leveling of the elevator despite changes in load or other disturbances which would tend to move the elevator away from the precise floor level.

3,815,712
ELEVATOR CONTROLS FOR SYSTEMS HAVING WIDELY SPACED LANDINGS

Dan C. Walton, Sylvania, Ohio, assignor to Reliance Electric Company, Euclid, Ohio

Filed Dec. 11, 1972, Ser. No. 314,261
Int. Cl. B66b *1/22*
U.S. Cl. 187—29 R **15 Claims**

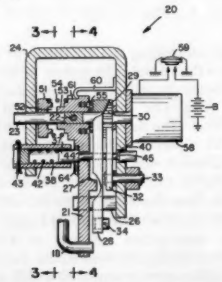


An elevator system for controlling cars on the basis of their separation from a destination, particularly for assigning hall calls to individual cars on this basis. The presence of an abnormally long spacing between a car and a destination, such as a hall call to be assigned, is sensed and a signal generated to represent that spacing. Landing count can be employed for normal spacing and a characteristic signal is utilized for the long spacing as encountered with a blind hatch region. A fixed pulse count is developed for each of the relatively uniform spaced landings and a proportionally longer pulse count is employed for the long travel increment of a blind hatch traverse. The blind hatch service factor is represented by a predetermined number of pulses which are accumulated on a per car basis in a master counter with other pulse series representing various service factors. The total counts for the cars are then compared and the hall call is assigned to the car with the lowest count as being best suited to serve the call.

3,815,713
CLUTCH RELEASED BRAKE LOCK

Howard H. Dietrich, deceased, 87 Commodore Pky., late of Rochester, N.Y. 14625 (Catherine Coleman Dietrich, executrix)

Filed June 13, 1972, Ser. No. 262,236
Int. Cl. F16d *67/02*
U.S. Cl. 192—13 A **10 Claims**

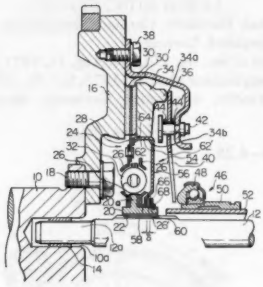


An automobile clutch, or the like, is adapted to be disengaged by operating either a combination clutch override and brake pedal, or a powered clutch pedal. If an electric push-button switch is operated before the override pedal is operated, the pedal will actuate the parking brake. If this switch is not pushed, operation of the override pedal will disengage the clutch, and will automatically release the parking brake if the latter was previously applied. The powered clutch pedal can be used only when the engine is operating. It controls a valve actuator, which selectively connects a power unit to the vacuum side of the engine manifold. When the pedal is depressed during engine operation, the manifold vacuum first takes up any slack developed in the clutch actuating mechanism and then disengages the clutch until the pedal is released. A non-linear rate of closure dash-pot device controls the reengagement of the clutch faces.

3,815,714
FRICTION CLUTCH

Kazuyoshi Hiraiwa, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohoma City, Japan

Filed Sept. 25, 1972, Ser. No. 291,538
Claims priority, application Japan, Oct. 21, 1971, 46-96737; Apr. 10, 1972, 47-42343; Apr. 12, 1972, 47-43274
Int. Cl. F16d *13/75*
U.S. Cl. 192—70.25 **11 Claims**



A friction engaging-device having a flywheel, a pressure plate, a clutch disc with pacings on both sides and disposed between the flywheel and pressure plate, a clutch hub connected to the clutch disc to be movable therewith, a spring means for moving the pressure plate toward and away from the flywheel, and a release mechanism connected with the spring means, which device has incorporated therein a thrust means having a cylindrical portion tightly but slidably fitted in a bore formed in the pressure plate and a radially extending flat portion adapted to move the clutch hub and accordingly the clutch disc away from the flywheel upon release of the spring means whereby drive torque through the clutch disc is completely and immediately interrupted.

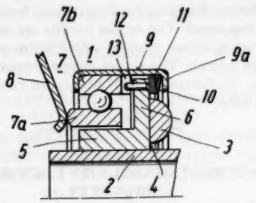
3,815,715
CLUTCH RELEASE

Paul Maucher, Sasbach, Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Buhl/Baden, Germany

Filed Oct. 24, 1972, Ser. No. 299,670
Claims priority, application Germany, Nov. 12, 1971, 2156161
Int. Cl. F16c *19/00, 33/30*
U.S. Cl. 192—98 **19 Claims**

A clutch release for use in motor vehicle clutches or the like includes a bearing and means for mounting the bearing. The bearing has two races, one of which is engaged by clutch release means while the other race is acted upon by clutch

operating means. The bearing is mounted in such a way as to provide for limited movement or displacement relative to the mounting means whereby automatic centering with respect to the axis of the clutch may be obtained.



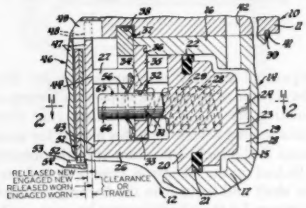
Means are operably disposed between the mounting means and one of the bearing races which permits said limited movement or displacement of the bearing while preventing rotation of the last mentioned bearing race.

3,815,716

AUTOMATIC PISTON ADJUSTER

James A. Harrington, Morresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 19, 1973, Ser. No. 342,525
Int. Cl. F16d *13/75*
U.S. Cl. 192—111 A **10 Claims**



A transmission having a fluid pressure piston and cylinder actuator for engaging a friction device for engaging a drive having return springs positioned between a retainer plate which is fixed on the cylinder housing and the piston which reciprocates in the cylinder. Posts on the piston extend through the retainer and one-way spring friction fasteners positioned on the posts retain the retainer plate and piston in released position with the springs compressed between the retainer plate and the piston as a preassembled subassembly, which is secured in released position by securing the retainer plate to the cylinder housing. The retainer plate has ears limiting movement of the fastener to the initial brake apply movement distance and operative after friction plate wear increases apply movement to slide the fastener on the post to limit return movement to maintain a constant running clearance distance in the disengaged position and a constant apply distance from the disengaged position to the engaged position to maintain constant friction device apply timing relative to the application of apply pressure for constant shift timing during the life of the transmission.

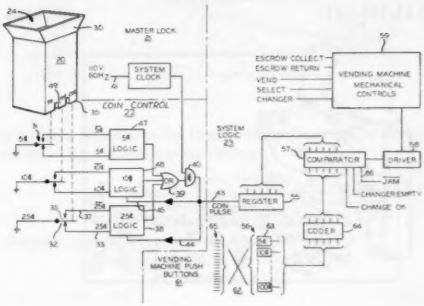
3,815,717

ELECTRONIC COIN CHANGER CONTROL CIRCUIT

Roger E. Arseneau, Arlington Heights, Ill., assignor to Arkorp, Inc., Arlington Heights, Ill.

Filed Oct. 10, 1972, Ser. No. 296,264
Int. Cl. G07f *5/16*
U.S. Cl. 194—1 N **19 Claims**

A coin changer control circuit has three separate logic input sections individually representing nickels, dimes, quarters, and any other coins or tokens which may be used in a vending machine or the like. A system clock is driven responsive to the usual 60 Hertz (or any other convenient frequency) of commercial power. Each logic input section gates out a selected number of clock pulses representing the monetary value of each deposited coin. A register stores the gated pulses as they are received and then the system compares the price of a vended product with the number of gated pulses to enable or



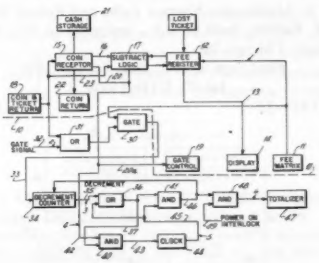
inhibit the vending cycle of the machine. If present, certain undesired vending functions (such as a jammed coin, changer empty, or the like) are also inserted into the comparator to create an inhibit function. However, once the vend cycle begins, it seizes control over the system and prevents a malfunction resulting from changing conditions which may occur during a vend cycle.

3,815,718

AUTOMATIC FEE DETERMINING AND RECEIPT TOTALIZING SYSTEM FOR PARKING FACILITIES

Paul A. Singer, Cincinnati, Ohio, assignor to The Cincinnati Time Recorder Company, Cincinnati, Ohio

Filed Nov. 27, 1972, Ser. No. 309,707
Int. Cl. G06f *9/08, 17/24*
U.S. Cl. 194—1 N **12 Claims**

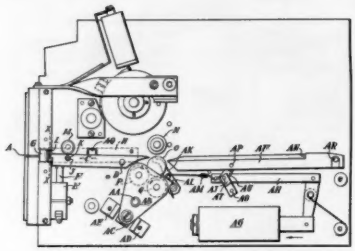


An automatic fee determining system for use in parking facilities including means to totalize the amount of coins accepted by the system. The system includes means for calculating the fee due from a parking ticket. The customer inserts coins into a coin receptor and a "vend" signal is produced only when the total value of coins at least equals the calculated fee due. A coin return is provided to return coins so long as the total value of coins accepted is less than the calculated fee due. Means are provided to capture the coins when the amount accepted is at least as large as the calculated fee due. A pulse generator responsive to the "vend" signal is provided to produce a series of pulses corresponding to the value of the coins captured. The coin value pulses are counted by a pulse responsive totalizer which counts and stores the total value of coins captured.

3,815,719
DATA PROCESSING APPARATUS

John H. Streeter, Berkhamsted, and Roger M. Jenkins, Hitchin, both of England, assignors to Revenue Systems Limited, Harpenden Hertfordshire, England

Filed Nov. 15, 1972, Ser. No. 306,580
Claims priority, application Great Britain, Nov. 16, 1971, 53127/71
Int. Cl. G07f 1/06
U.S. Cl. 194—4 G 6 Claims

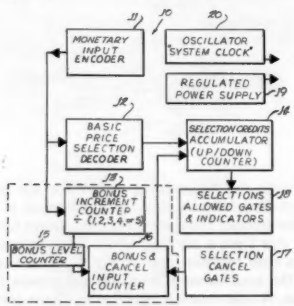


The invention relates to apparatus for processing card-carried data, and the object of the invention is to reduce the possibility of an unauthorised card being fed into such apparatus. For this purpose a passage leading from a card entry slot to the data processing means is blocked unless a card of a predetermined minimum width is present in the slot. The passage is normally blocked by a pivotably-mounted tray having a forward edge opposite the card entry slot and being held in this blocking position by two spring members mounted one on either side of the tray. When a card of the required minimum width is inserted in the slot, it separates the two spring members and releases the tray so that it can be pivoted out of the blocking position.

3,815,720
MONEY RECEIVING AND CREDIT ACCUMULATOR SYSTEM

William V. Machanian, Niagara Falls, and Robert W. Wheelwright, Buffalo, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Sept. 8, 1972, Ser. No. 287,290
Int. Cl. G11b 19/08
U.S. Cl. 194—15 17 Claims

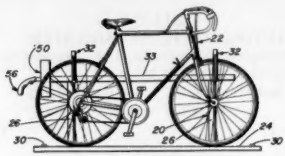

MONETARY INPUT ENCODER
OSCILLATOR "SYSTEM CLOCK"
REGULATED POWER SUPPLY
BASIC PRICE SELECTION DECODER
SELECTION CREDITS ACCUMULATOR (UP/DOWN COUNTER)
BONUS INCREMENT COUNTER ÷ (1,2,3,4,or 5)
SELECTIONS ALLOWED GATES & INDICATORS
BONUS LEVEL COUNTER
BONUS & CANCEL INPUT COUNTER
SELECTION CANCEL GATES

A money receiving and credit accumulator system is disclosed herein which can continuously receive coins therein without the need of resetting a memory circuit or the like. The credit pulses and bonus credit pulses produced are stored until such time as a scanning signal transfers these pulses into an up-down counter. This allows a plurality of coin receiving and tune selection boxes to be positioned at remote locations and each coin receiving box can receive money and store credits and bonus credits independent of the other. The number of credits accumulated for each coin or bill is determined by the monetary value of the coin or bill and the number of bonus credits added to the circuit is determined by the total amount of money deposited. The bonus credits are automatically inserted into an up-down counter which forms part of the credit accumulator circuit. The entire credit accumulator circuit is designed to be formed as an integrated circuit on a single monolithic chip.

3,815,721
COIN OPERATED SECURITY LOCK RACK FOR BICYCLES

Margarito F. Montoya, 7653 Washington Ave., Whittier, Calif. 90602, and Peter F. Carrilo, 8429 Daleberry Dr., Pico Rivera, Calif. 90660

Filed Dec. 15, 1972, Ser. No. 315,654
Int. Cl. G07f 17/10
U.S. Cl. 194—40 7 Claims

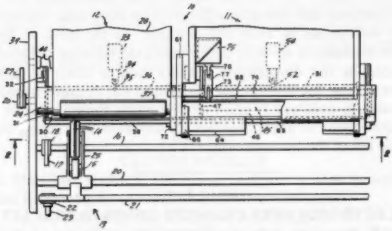


A coin operated security rack apparatus for bicycles to minimize the danger of thefts, the apparatus having a bicycle rack with locking means for both front and rear wheels. The locking means for the wheels includes a shaft for securing the locking means in the locked position after the locking means have been locked on the wheels. A coin operated mechanism controls the shaft and locks it in the locking position so that the locking means for the wheels cannot be open until the coin operated mechanism is unlocked to thereby unlock the shaft so that it can be moved to a position for unlocking the locking means for the wheels.

3,815,722
SOLENOID CONTROLLED PAPER HANDLING MECHANISM

James M. Sessoms, Rt. 1, Box 171 - A, Maitland, Fla. 32751

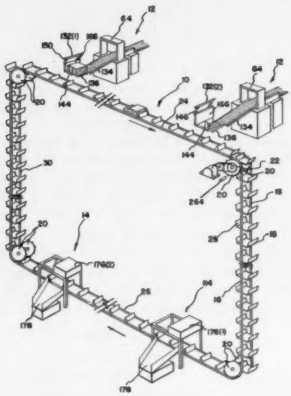
Filed Mar. 15, 1971, Ser. No. 124,342
Int. Cl. B41j 13/00
U.S. Cl. 197—127 R 6 Claims



A passbook handling apparatus for positioning and holding passbooks, deposit slips or other paper during printing. A guide assembly is provided for guiding a passbook, or the like, over the platen of a printing mechanism, gripping the passbook with a gripping roller when positioned and then having

the guide means shift from a first to a second position by actuating a solenoid connected thereto for wrapping a portion of the passbook around the platen and holding it in position during printing. Means are also included for moving the passbook from one line to the next and for releasing the solenoid actuated gripping rollers and guide means upon completion of the entry.

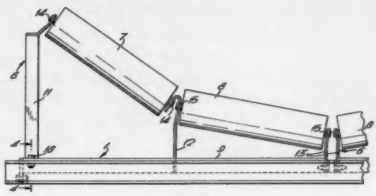
3,815,723
METHOD AND APPARATUS FOR TRANSFERRING AND STORING ARTICLES
James C. Wright, and Reginald A. Reed, both of Golden, Colo., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Nov. 5, 1971, Ser. No. 195,944
Int. Cl. B65g *43/00*
U.S. Cl. 198—38 **28 Claims**



This invention relates to a vertically-disposed endless loop continuously-operating tray conveyor having at least two loading stations and at least two unloading stations. The load-receiving capability of each tray is automatically sensed in advance of its arrival at a loading station and remembered so that any of the loading stations ready to deliver a bundle can be actuated to do so when the empty tray arrives. Once loaded, the identity of the load on a particular tray is remembered in terms of the loading station it came from. The trays thus loaded may be emptied immediately through one or more of the unloading stations ready to receive same or, alternatively, all or part of the loads can be circulated and thus stored on the conveyor until such time as an unloading station is readied to discharge them. The method of using the system involves tracking the loaded trays until they are emptied at which point the discharge of the load is noted; however, it is the determination of the load-receiving capabilities of each tray preparatory to loading the empty ones that becomes the overriding control for the system thus eliminating the cumulative errors should a false load discharge signal be received.

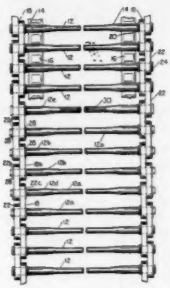
3,815,724
CONVEYOR BELT IDLER ASSEMBLY
Frank Joseph Nott, Blackrock, Australia, assignor to Production Equipment Limited, Huntingdale, Victoria, Australia
Filed Sept. 25, 1972, Ser. No. 291,559
Int. Cl. B65g *15/08*
U.S. Cl. 198—192 R **4 Claims**

Conveyor belt idler assembly including a base and a number of idler rollers rotatably mounted on individual shafts which are supported on the base in end to end relationship. The shafts are mounted on individual support frames which are



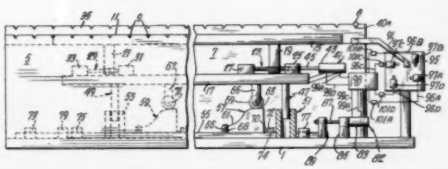
releasably attached to the base so that rollers can be removed for servicing without moving the base.

3,815,725
CONVEYOR CHAIN APPARATUS
Shayne T. Linderman, Newdale, Idaho 83436
Filed Aug. 8, 1972, Ser. No. 278,755
Int. Cl. B65g *15/30*
U.S. Cl. 198—195 **5 Claims**



An endless conveyor chain with a plurality of permanently secured links and rods, a plurality of replaceable links and rods secured together by snap ring means, and a plurality of links and rods provided with push bar members thereon, all of said rods having enlarged diameter portions for contact by a drive sprocket.

3,815,726
CONVEYOR
Edward I. Klein, Montreal, Quebec, Canada, assignor to V-Mark Automation Ltd., Montreal, Quebec, Canada
Continuation of Ser. No. 25,792, April 6, 1970, abandoned. This application Dec. 8, 1971, Ser. No. 206,097
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **6 Claims**



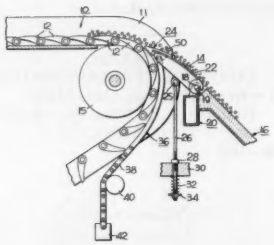
An article conveyor comprising a first pair of plates mounted for cyclic movement with respect to a second pair of

fixed plates so as to move an article stepwise along the second pair of plates. Means are provided, operated by the cyclic movement of the first pair of plates, for stopping the first pair of plates in various positions in their path of movement.

3,815,727
REPLACEABLE TIP FOR END STRIPPER OF TRAVELING GRATE CONVEYOR AND END STRIPPER HAVING SUCH REPLACEABLE TIP

Walter J. Hartwig, Hartland, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 30, 1973, Ser. No. 356,049
Int. Cl. B65g *45/00*
U.S. Cl. 198—230 **15 Claims**

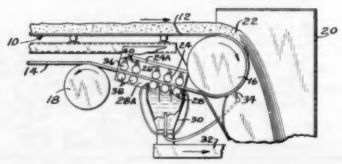


A replaceable stripper tip for the end stripper which strips material such as hot pelletized ore from the discharge end of a traveling grate conveyor such as that used in a Grate-kiln system or the like, and a cooperating main body portion of the stripper which is adapted to receive the replaceable stripper tip. The stripper tip member is adapted for slip-on (or off) engagement with or disengagement from the main body member of the stripper by the use of clip-like lug means or the like on one of said members which interengage with cooperating surfaces on the other of said members. Additionally, the detachable stripper tip when in position is held firmly engaged with the main body of the stripper by a downward tension exerted by a "let-down" bar and associated chain and weight connected to the stripper tip, the "let-down" bar and associated chain and weight also performing the function of limiting the degree of pivotal opening of the empty conveyor grates as they move downwardly toward the lower run of the conveyor.

3,815,728
BELT CLEANING SYSTEM

Warren R. Vaughan, Ontario, Canada, assignor to Borg-Warner (Canada) & Ltd., Ontario, Canada

Continuation of Ser. No. 158,200, June 30, 1971. This application May 4, 1973, Ser. No. 357,153
Int. Cl. B65g *15/42*
U.S. Cl. 198—230 **1 Claim**

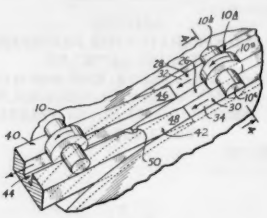


Means comprising floating and idler rolls are arranged with respect to the return flight of a conveyor belt to clean or remove material therefrom.

3,815,729
ARTICLE ORIENTING APPARATUS

Peter Eli Mortensen, Milwaukie, Oreg., assignor to Carlton Company, Portland, Oreg.

Fikd June 2, 1972, Ser. No. 259,242
Int. Cl. B65g *47/24*
U.S. Cl. 198—287 **3 Claims**

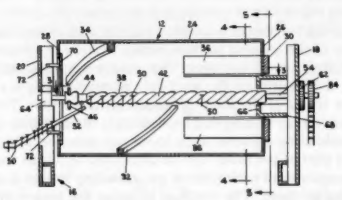


Apparatus and method for assemblying from a mass of articles a row of such articles. The articles in the mass are randomly orientated, and are assembled in the row with the articles having like orientation. The apparatus includes a container bottomed by a floor for supporting the mass of articles. A channel extending in an annular course over said floor is adapted to seat the articles with the articles having like orientation. A receiver having a channel therein is positioned adjacent the floor of the container with the channel of the receiver registering with and forming an extension of the channel of the floor. The container is revolved about an axis concentric with the axis about which said channel extends, to effect seating of the articles in the channel of the floor and subsequent transfer of articles to the channel of the receiver.

3,815,730
ORIENTING APPARATUS AND METHOD

Theodore C. Zwiep, 966 Parnelee N.W., Grand Rapids, Mich. 49504, and John R. DenBleyker, 644½ E. 10th. St., Holland, Mich. 49423

Filed Aug. 2, 1972, Ser. No. 277,391
Int. Cl. B65g *47/24*
U.S. Cl. 198—287 **15 Claims**



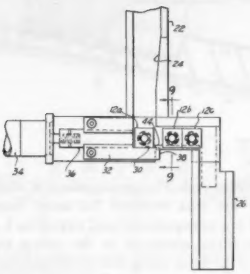
An apparatus and method for orienting elongated headed articles such as nails and the like. A pair of rotatably mounted, horizontally disposed orienting rolls have helical grooves of opposite hand. The rolls are rotated in opposite directions and such that the surfaces of the rolls move upwardly through a slot formed between the two rolls. The elongated articles are dumped onto an orienting end of the rolls and by rotation of the rolls fall between the slot with the heads of the articles being retained between the rolls. The articles are worked into the roll grooves which mate at the slot and are moved in the grooves by rotation of the rolls to a discharge end of the rolls wherein they are removed therefrom seriatim in oriented form. The apparent motion of the mating grooves is toward the discharge end as the rolls rotate. Rejection means, such as pins or brushes on the rolls at the discharge end thereof,

remove articles which are horizontally disposed between the rolls. The articles are fed to the orienting rolls by a rotating drum which surrounds the rolls. The drum has radially oriented baffles for lifting the articles and dumping the same onto the orienting end of the rolls.

3,815,731
ORIENTING FEED MECHANISM

Fritz J. Lupo, Bloomfield Hills, and Douglas E. Brining, Southfield, both of Mich., assignors to Feedmatic-Detroit, Inc., Southfield, Mich.

Filed Dec. 11, 1972, Ser. No. 313,842
Int. Cl. B65g 47/24
U.S. Cl. 198—288 7 Claims

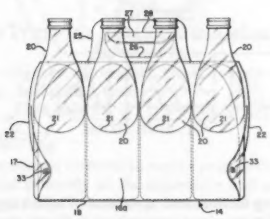


Mechanism for feeding small parts having a laterally facing surface inwardly of the edges and at one side only thereof. The parts are pushed along a track having a flange supporting the part by an edge, and a ledge engageable with the laterally facing surface. There is a gap in the flange track and unless the side of the part having the laterally facing surface is adjacent the ledge, the part falls off the track.

3,815,732
CONTAINER CARRIER

Mindaugas Julius Klygis, Evergreen Park, and Michael Warren Brezette, Schaumburg, both of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed Sept. 18, 1972, Ser. No. 289,909
Int. Cl. B65d 75/04
U.S. Cl. 206—163 3 Claims

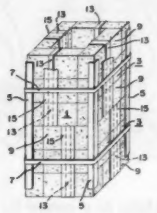


The present invention relates generally to improvements in manually transportable carriers for accommodating a plurality of containers, as for example, bottles and the like, and more particularly, to container carriers of the reuseable type comprised of a single folded sheet of material. The end walls of the carrier comprise integral brace members connected between the bottom wall and the side walls of the carrier. These brace members are further slidably interlocked in slots in the center wall of the carrier.

3,815,733
CONSTRUCTION UNIT ASSEMBLY

Thomas Roberts, Jr., 120 Mandalay Rd., Oakland, Calif. 94618

Filed Oct. 19, 1972, Ser. No. 298,819
Int. Cl. B65d 71/04, 85/46, 85/62
U.S. Cl. 206—322 7 Claims



A construction unit assembly comprising two or more subassemblies formed of light weight brick are arranged end to end in column formation and held together in a unitary assembly by corner angles maintained in position by metal banding. In the construction of a building, such hollow columnar units are adapted to provide for reinforcing members, heating or ventilating conduits and the like.

3,815,734
DISPENSER

Peter Alexander Kruckel, Nurnberg, Germany, assignor to Messrs-Schwan-Bleistift-Fabrik Schwanhausser & Co., Nurnberg, Germany

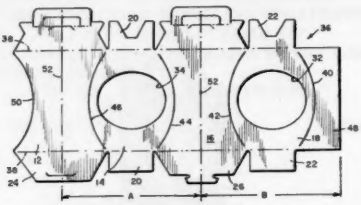
Filed Mar. 6, 1972, Ser. No. 231,912
Claims priority, application Germany, Mar. 19, 1971, 2113434
Int. Cl. B65d 83/02, 25/04, 43/20
U.S. Cl. 206—443 11 Claims

A dispenser for elongate articles, such as pencil leads, comprising a rectangular housing, open at one end, and divided into upper and lower chambers by an intermediate wall. Downwardly and upwardly projecting sills are formed on the upper and lower walls of the housing at the one end, to define a discharge aperture for each chamber. A slider openably closes the two apertures, the sill of the lower chamber preventing a lead sliding from the lower chamber, when the dispenser is tilted, while a lead from the upper chamber can slide out.

3,815,735
CARTON

Benjamin J. Cucuo, Springfield, Mass., assignor to Pioneer Packaging, Inc., Chicopee, Mass.

Filed June 28, 1972, Ser. No. 267,105
Int. Cl. B65d *5/46, 5/50*
U.S. Cl. 206—485 **12 Claims**

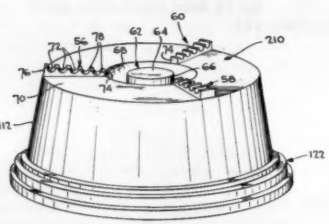


This invention relates to a carton for holding a ball with diametrically disposed portions of its surface exposed, said carton having rectangularly arranged side walls with closure flaps at the lower and upper ends which collectively form spaced parallel flat, bottom and top walls, the distance between which corresponds substantially to the diameter of the ball, wherein two of the side walls are convex and the distance between them corresponds substantially to said diameter of the ball and wherein the other two sides are concave and contain centrally located openings of substantially elliptical configuration through which diametrical surface portions of the ball project; and a blank adapted to be folded up to form the aforesaid carton.

3,815,736
FOOD PLATE SERVICE COVER

Mirko S. Sedlak, 1991 Delowe Dr., S.W. H5, Atlanta, Ga. 30311

Continuation-in-part of Ser. No. 103,992, Jan. 5, 1971, abandoned. This application Dec. 13, 1971, Ser. No. 207,398
Int. Cl. A47g *19/02, 23/04*
U.S. Cl. 206—501 **6 Claims**



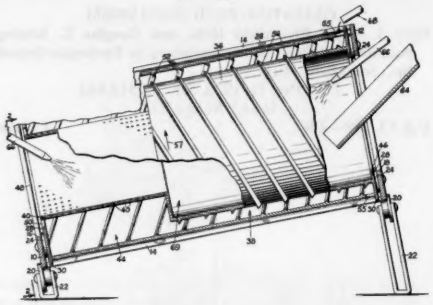
A food service cover integrally constructed of a plastic material and including a top portion having radially extending stabilizing arms to hold a food plate stacked thereon and a side wall depending from the peripheral rim of the top portion and having a bottom peripheral lip carrying a protrusion ring to engage the outer rim of a food plate such that the food plate service cover is prevented from sliding on the food plate.

3,815,737
GRAVITY ORE CLASSIFIER

Gene S. Katter, Box 204, Brownsville, Oreg. 97324

Filed Nov. 6, 1972, Ser. No. 304,079
Int. Cl. B03b *7/00*
U.S. Cl. 209—44 **10 Claims**

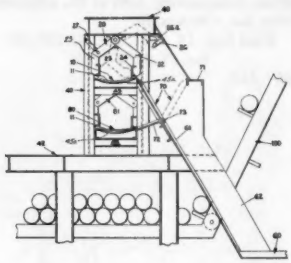
A classifier having an outer tubular casing and a scrubber barrel with the casing. The scrubber barrel has an imperforate portion at the inlet end thereof and a perforated portion at the outlet end. The scrubber barrel is of less diameter than the outer casing to provide a space therebetween. The inner surface of the casing has a screw conveyor arranged to urge material toward the inlet end and the outer surface of the scrubber barrel has a screw conveyor arranged to urge material toward the outlet end. The arrangement is such that fines discharged into the area between the outer casing and the scrubber barrel are concentrated and urged back toward the inlet end by the screw conveyor on the casing, the upper or lighter portion of the fines being shaved off and moved toward the outlet end by the conveyor on the scrubber barrel. Means are provided to laterally shake the assembly.



3,815,738
LOG SORTING METHOD AND APPARATUS

Harold J. Sweet, Rhinelander, Wis.; Robert L. Papworth, Chassell, Mich., and John G. Grimm, Jr., Tripoli, Wis., assignors to Marplex Products Company Inc., Rhinelander, Wis. and Herman Engineering Corporation, Houghton, Mich.

Filed July 14, 1972, Ser. No. 272,019
Int. Cl. B07c *5/04*
U.S. Cl. 209—82 **88 Claims**



A log sorting method and apparatus in which logs are conveyed on a flat, continuous conveyor between the arms of a plurality of ejector yokes. A kicker rail is connected to one set of arms on one side of the conveyor and a longer retainer rail is secured to the arms on the other side of the conveyor. When the yoke is at rest, these rails are generally continuous with the remaining side rails of the conveyor. The logs are scanned for minimum diameter and those with the largest minimum diameter are ejected from the conveyor by the first ejector yoke. Progressively smaller logs are ejected at successive stations. If there is no gap between the logs as they come to an ejector, as determined by an energy transmitting beam passing across the conveyor, then the logs will not eject. The logs are

normally ejected into receiving bins, but can be diverted to the return side of the conveyor or to a second parallel conveyor, which carries them to another ejector which in turn ejects them onto a live deck from whence they are carried to the saws or to some other operation or location.

3,815,739

AIR FLOTATION MACHINE

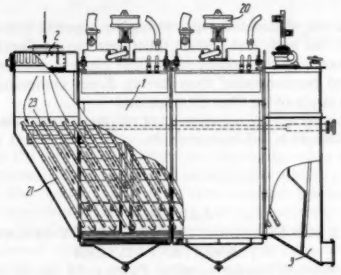
Jury Petrovich Uvarov, Oktyabrsky prospekt, 384, kv. 35., Ljubertsy Moskovskoi oblasti, and Rem Iosifovich Gurevich, Otkrytoe shosse, I, korpus 14, kv. 68., Moscow, both of U.S.S.R.

Filed Nov. 3, 1971, Ser. No. 195,161

Claims priority, application U.S.S.R., Apr. 23, 1970, 1424477

Int. Cl. B03d *1/26*

U.S. Cl. 209—170 **7 Claims**



An air flotation machine with a slit-type airlift features inclined baffle plates located in the chamber thereof in rows located on both sides of said airlift and adapted to guide the sliding-down material to pass along the length of the chamber towards the inlet of the slit-type airlift, the top edge of which is located above the froth overflow lip with the result that the material which slides down along the inclined baffle plates, is entrained by the airlift to be multiply fed onto the froth bed.

3,815,740

THIN WATERFALL SEPARATING AND SCREENING APPARATUS

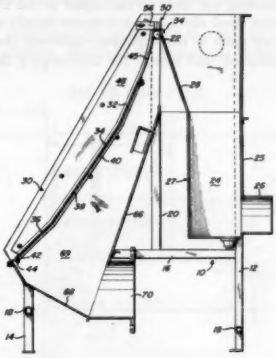
Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed June 28, 1971, Ser. No. 157,250

Int. Cl. B07b *1/06*

U.S. Cl. 209—264 **10 Claims**

This invention is directed to screen units and screen assemblies applied primarily to the separation and reclamation of solids, particularly fibrous solids, from a fluid slurry. Preferred embodiments are distinguished by a screen section or sections the flow surface of which is defined by bars or wires arranged in closely spaced relation and in a direction transverse to slurry flow thereacross. In use, the screen sections are so established that the flow surface defined thereby is in a plane or planes inclined to a horizontal. Each embodiment of the invention is characterized by a screen section or assembly of screen sections having in connection therewith a feed system including a variable flow control means. The controls provided enable a directed initial feed of a fibrous or like slurry in a thin waterfall form and in a manner whereby the initial engagement of the slurry with the flow surface can be variably placed with an impact effect. The structural features provided enable oily, fatty and like adherent substances to be optimally



separated from the solids content of the slurry in movement thereof to and over the flow surface provided by the invention embodiments.

3,815,741

PLANSIFTER MOUNTING AND CLAMPING APPARATUS

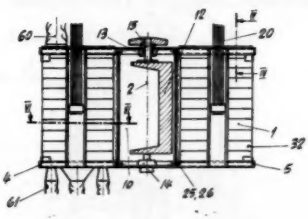
Alois Keller, Oberuzuil, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

Filed Jan. 16, 1973, Ser. No. 324,060

Claims priority, application Switzerland, Jan. 20, 1972, 866/72

Int. Cl. B07b *1/28*

U.S. Cl. 209—319 **11 Claims**



A plansifter having a vibratory mounting and at least two stacks of sieves formed by a number of sieve frames mounted one upon the other, the said stacks of sieves being disposed in symmetrical positions about a vibrator and comprising stack clamping devices which produce vertical forces.

3,815,742

APPARATUS FOR AND METHOD OF AUTOMATICALLY REMOVING POLLUTANTS FROM A FLOWING STREAM

Jacques L. Dubouchet, Larchmont, N.Y., assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Grenoble, France

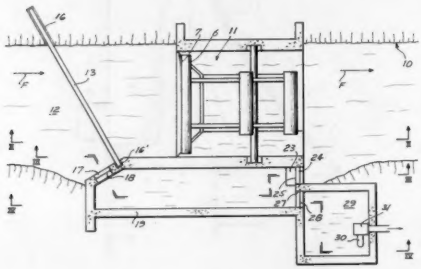
Filed Mar. 23, 1972, Ser. No. 237,388

Int. Cl. E02b *15/04*

U.S. Cl. 210—83 **7 Claims**

The apparatus herein essentially comprises a separator which is located alongside a liquid stream bed and in communication with the latter so that there is diverted thereunto at least a selected depth of the top of the stream extending below the maximum expected depth of pollutant material in the

liquid, a vertical liquid chamber communicating at its bottom with the bottom of the separator, means for permitting the discharge of liquid from the upper portion of the chamber while maintaining the level of the liquid in the chamber at a given constant level above the maximum height of any interface that may exist in the separator between the liquid and pollutant material, and means for discharging the separated



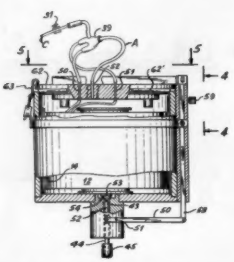
pollutant material collected in the separator. If the stream is diverted to the aforesaid depth this is done by controlling the flow of the stream so that at the place of diversion the level of the stream is maintained substantially constant, and such diversion is accomplished by blocking the flow in the top portion of the stream to the aforesaid depth and by-passing it through the separator.

3,815,743

METHOD AND APPARATUS FOR HEMODIALYSIS

Donald Snyder, 140 Hewlett Neck Rd., Hewlett Neck, N.Y.

Filed June 9, 1971, Ser. No. 151,324
Int. Cl. B01d *31/00*
U.S. Cl. 210—94 **7 Claims**



A chamber for receiving an artificial kidney dialysis coil, employing the coil for hemodialysis of a patient and storing the coil under sterilization conditions between uses. The chamber is employed in a method of hemodialysis permitting of repeated use of the same coil.

3,815,744

FILTER CONSTRUCTION

Albert G. H. Vanderpoel, 1126 Brightglen Cir., Westlake Village, Calif. 91361

Filed Jan. 2, 1973, Ser. No. 320,473
Int. Cl. B01d *35/02*
U.S. Cl. 210—94 **8 Claims**

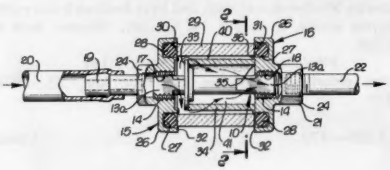
A fuel filter comprises:

a. an elongated rod-like body having opposite end portions which have lengthwise extending reliefs at the sides thereof, said end portions also having peripheral thread sections circumferentially interrupted by said reliefs,

b. threaded caps mounted on said body thread sections to extend about the reliefs,

c. a porous tubular filter element through which the body projects,

d. the body having a closure thereon to close one end of the filter element so that the element is retained between said clo-



sure and one of said end caps closing the opposite end of said element, one body end portion relief then having direct communciation with the outside of the filter element and the other body end portion relief then having direct communication with the inside of the filter element, and

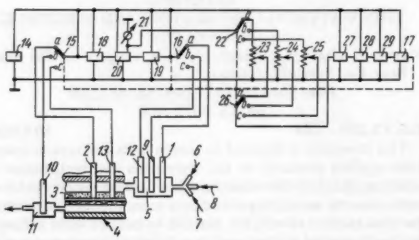
e. a casing having opposite ends retained at said end caps and within which said body projects.

3,815,745

DEVICE FOR EVALUATING THE QUALITY OF CAKE IN INTERMITTENT FILTERS

Vitaly Petrovich Bondarev, ulitsa Pastera, 10, kv. 6; Georgy Varlamovich Tusunian, 1 tupik Yakova Nikoladze 10; Genady Georgievich Budenny, Varketilsky massiv, 10 Kvartal, korpus 16, kv. 8; Nodar Vladimirovich Mgeladze, Kakhetinskoe shosse, 17, kv. 10; Andr Vladimirovich Anisimov; Georgy Mikhailovich Saradzhev; Suren Emmanuilovich Shakhbudagian-Shou, all of Tbilisi, and Leonid Vladimirovich Oringolts, Berdichev, all of U.S.S.R.

Continuation of Ser. No. 110,002, Jan. 27, 1971, abandoned.
This application Nov. 13, 1972, Ser. No. 306,337
Int. Cl. B01d *35/00*
U.S. Cl. 210—96 **3 Claims**

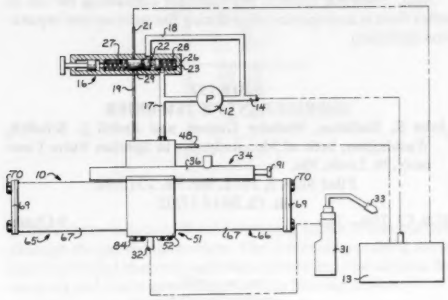


A device for determining the quality of cake in intermittent filters comprising at least one cake thickness sensor, which functions during the step of slurry filtration, and is further furnished with cake washing degree sensors and cake drying degree sensors, the output of each of the sensors is coupled to the input of a measuring unit only during a corresponding filter operation step.

3,815,746
AIR BLEED LIQUID FILTER ASSEMBLY

Harold L. Ward, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 18, 1972, Ser. No. 227,439
Int. Cl. B01d 35/16
U.S. Cl. 210—134 10 Claims

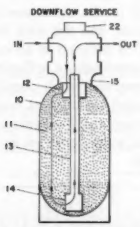


An air bleed liquid filter assembly having a pair of independently replaceable filters. A control valve is positionable to change the flow of liquid from one filter to the other to permit replacement of the used filter without interrupting operation of the filter system. The control valve is further positionable to divert a portion of the liquid flow through the newly-installed filter and to vent any air entering the system during such filter replacement operation to assure that a continuous air-free flow of filtered liquid is discharged from the filter assembly.

3,815,747
WATER SOFTENING SYSTEMS

Willis E. Clack; Clifford Kay, and Charles E. Nygren, all of Madison, Wis., assignors to Clack Corporation, Madison, Wis.

Filed May 26, 1972, Ser. No. 257,377
Int. Cl. B01d 29/38
U.S. Cl. 210—140 2 Claims

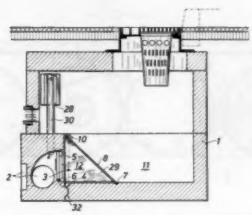


A method and apparatus for softening water in a single conditioning tank system. The water flow through the mineral bed in each service cycle is reversed from the last preceding service cycle and the water-brine solution flow through the mineral bed in each regeneration cycle is reversed from the last preceding regeneration cycle. That is, a downflow service cycle through the mineral bed is followed by an upflow regeneration cycle, an upflow service cycle and a downflow regeneration cycle.

3,815,748
UNIVERSAL BASIN FOR USE IN A SEWER SYSTEM

Jorgen Mosbaek Johannessen, Koge, Denmark, assignor to Per Pontoppidan Sorensen, Solrod Strand, Denmark, a part interest

Filed Sept. 26, 1972, Ser. No. 292,316
Claims priority, application Denmark, Sept. 28, 1971, 4705/71
Int. Cl. B01d 21/26
U.S. Cl. 210—163 10 Claims

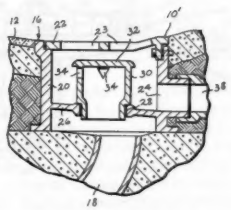


A basin for use in a sewer system and having a draining device designed as a cover consisting of a housing with a submerged inlet opening and a centrally located outlet opening, the said housing containing an outlet chamber with a circular or helical sidewall along which an inlet tube opens tangentially into the outlet chamber. When the water level in the basin raises, the water flowing into the outlet chamber is caused to circulate in such a manner that it works as a centrifugal brake retarding the water flow.

3,815,749
STREET DRAIN FOR USE WITH A SEWER SYSTEM

Lawson B. Thompson, 1144 E. Bronson St., South Bend, Ind. 46615

Filed Apr. 23, 1973, Ser. No. 353,499
Int. Cl. E03d 1/00
U.S. Cl. 210—163 1 Claim



A street drain which is to be used with a sewer system and which includes a water collection basin, positioned in the street, and a dry well generally located adjacent the street. The collection basin has two discharge openings. One of the openings is placed in communication with the dry well and the other of the openings is placed in communication with the sewer system. The basin discharge opening which is connected into the sewer system is so located relative to the dry well-connected discharge opening that water, such as storm water, entering the collection basin will first pass into the dry well until the dry well is filled and thereafter will pass into the sewer system.

3,815,750
ARRANGEMENT FOR CONTINUOUS TREATMENT OF POLLUTED LIQUIDS

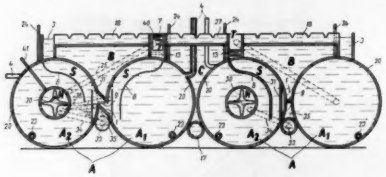
Svatopluk Mackrle, Brno, and Vladimir Mackrle, Praha, both of Czechoslovakia, assignors to Ceskoslovenska akademic Ved, Praha, Czechoslovakia

Division of Ser. No. 94,668, Dec. 3, 1970, abandoned. This application May 30, 1972, Ser. No. 257,589

Claims priority, application Czechoslovakia, Dec. 11, 1969, 8151-69

Int. Cl. B01d *21/26*

U.S. Cl. 210—202 **5 Claims**



Polluted liquids are treated by a bioflocculation process and the thus obtained floccular suspecsion is separated by filtration in a perfectly floating sludge blanket, whereby prior to filtration, the suspension, created in the course of the bioflocculation process, is subjected to a sedimentation, whereby a first stream obtained by sedimentation containing a diluted suspension is passed to be filtered in the perfectly floating sludge blanket and a second stream containing a concentrated suspension is returned into the bioflocculation process.

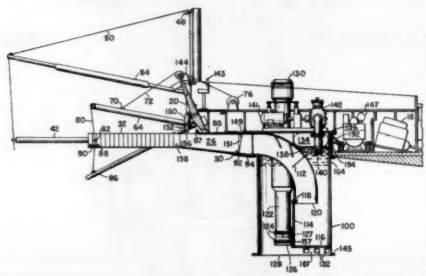
3,815,751
OIL/WATER SEPARATION AND RECOVERY SYSTEM

Jack D. Pavlovic, Oakland, Calif., assignor to Pollution Recovery Systems, Oakland, Calif.

Filed Oct. 6, 1971, Ser. No. 187,038

Int. Cl. E02b *15/04*

U.S. Cl. 210—242 **6 Claims**



Apparatus is provided for separating fluids of different densities, where the fluids have a substantially continuous common interface. A separating tank is provided having first and second sections, partially separated by a wall extending across the tank and having a height substantially less than the height of the tank, so as to allow communication between the sections. An intake channel directs the flow of fluids downwardly, permitting contact between the lower density fluid flowing in the channel and a layer of the lower density fluid maintained in the tank, so as to capture the major portion of the entering lower density fluid. The higher density fluid plus entrained lower density fluid is directed downwardly into the second section and assumes a tortuous path over the wall into the first section, while the lower density fluid escapes upwards into the layer of the lower density fluid. Means are provided in a lower portion of the first section for continuously removing the fluid of higher density, while means are provided in an upper portion of the tank for continuously removing the fluid of lower density.

In a preferred embodiment the separating tank is mounted in a vessel below fluid level and the intake channel connected to a flexible articulated trough which is controlled to maintain a relatively constant level of fluid, until the fluid reaches the downwardly curving portion of the channel.

Also, a flexible boom is provided for containing the oil or other fluid in anticipation of or during the removal and separation operation.

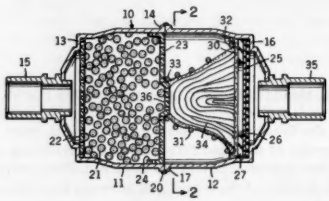
3,815,752
REFRIGERANT FILTER-DRIER

John E. Hoffman, Webster Groves, and Ardell J. Schelich, Washington, both of Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Mar. 2, 1972, Ser. No. 231,198

Int. Cl. B01d *27/02*

U.S. Cl. 210—266 **9 Claims**



A filter-drier for refrigeration systems which includes a bed of adsorbent material contained in a housing, and a wire form of substantially conical or cylindrical shape disposed in the housing downstream of the adsorbent material bed, the wire form, when a substantially conical shape, having its larger end arranged toward the housing outlet and its relatively smaller end disposed toward the adsorbent material bed. A filter media of inorganic fibrous material is disposed in the wire form and assumes substantially the shape of the wire form. A pad of inorganic fibrous material is located adjacent to and downstream of the filter media contained in the wire form, and is held against the housing by the wire form to provide a seal to assure flow through the filter media. In the preferred embodiment, the filter media contained in the wire form and the pad are of fiberglass, and the wire form is a compression spring. The wire form is secured in an outlet housing section so that such section constitutes a self-contained subassembly, while the adsorbent material bed is contained by a foraminate structure that is secured to an inlet housing section so that such section constitutes a self-contained subassembly also. The two self-contained subassemblies are placed together and joined by a single weld.

3,815,753
PURIFIER DEVICE

Nicholas Sama, 4940 S.W. 95th Ave., Miami, Fla. 33144

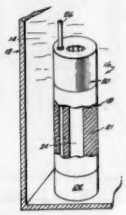
Continuation of Ser. No. 886,436, Dec. 19, 1969, abandoned. This application June 18, 1972, Ser. No. 263,390

Int. Cl. B01d *25/02*

U.S. Cl. 210—284 **14 Claims**

A liquid purifier device for immersion in a body of liquid. It includes an annular canister with a through central column or main duct. The canister has inlet and outlet means in spaced relation so that there is a flow path through the canister interior or secondary duct, and in this flow path a purifying medium is located. When submerged, all of the inlet means are at a higher pressure level than the exit means whenever a flow of

air is introduced into the lower end of the column so that a pressure differential is created, and a tube is provided to introduce a flow of air into the lower end of the column when it is submerged so that the differential of pressure thus created

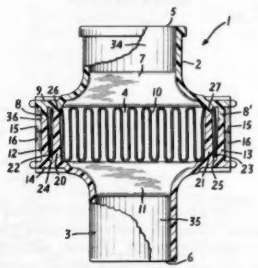


in the column acts as a lift tube pumping means to cause a flow through the purifying medium. The preferred purifying medium is activated charcoal, and the canisters may be adapted for stacking and use in combination with a filtering device.

3,815,754
BOX FILTER

David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Sept. 16, 1971, Ser. No. 181,122
Int. Cl. B01d *27/08*
U.S. Cl. 210—445 **16 Claims**



A disposable box filter is provided comprising a box housing in at least two portions and having a fluid chamber with two fluid ports, and a filter element in sheet form extending across the fluid chamber and held at its sides by the housing across the line of flow between the fluid ports.

3,815,755
ADJUSTABLE GLASS STAKE

Stephen W. Lyszczek, 5348 Vineland Ave., North Hollywood, Calif. 91601

Filed May 26, 1972, Ser. No. 257,233
Int. Cl. A47g *19/08*
U.S. Cl. 211—41 **4 Claims**

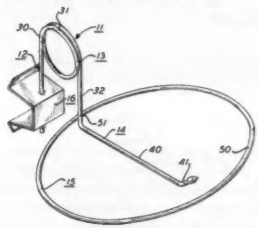
An adjustable glass stake for securing glass panes against a glass rack of the type adapted to be mounted on the bed of a truck which has a channel therein which extends the length of the stake. Within each channel is placed a plurality of locking members which can be set at any position in the channel along the stake. Each locking member has a holding arm pivotally connected thereto, and each pair of adjacent holding arms are pivotally secured at their opposite ends to a holding pad. The holding pad provides the surface which presses against the glass panes. This surface is adjustable by uniformly altering

the distance in the channel between the locking members to which the particular pair of holding arms are secured, which arms in turn support a single holding pad.

3,815,756
GUARDED INSERT AND GADGET SUPPORTING DEVICE

Robert N. Cox, Cranbury, N.J., assignor to Etamco Industries, Belleville, N.J.

Filed Oct. 13, 1972, Ser. No. 297,253
Int. Cl. A47f *7/00*
U.S. Cl. 211—57 **4 Claims**



A guarded insert and gadget supporting device, for providing rigid safety protection for a call-out card display and a gadget display, which is provided with a rigid guard portion for securing the displays from damage and for securing the personnel in the vicinity of the display from injury, for use in conjunction with a display device which includes an upstanding loop portion for displaying promotional call-out materials and an extending hook portion for displaying a gadget or other device, for sales promotions and associated gadget displays, to provide safety, efficiency, and convenience in the utilization thereof.

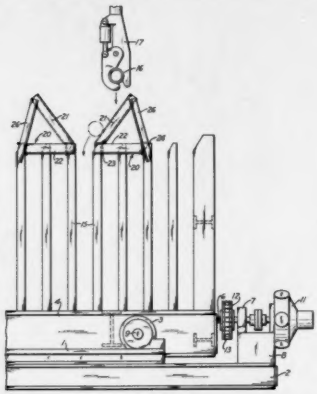
3,815,757
DETACHABLE PIPE GUIDES FOR PIPE RACKING FINGERS

Homer J. Woolslayer, Tulsa, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.

Filed Feb. 21, 1973, Ser. No. 334,421
Int. Cl. B65g *65/32*; **A47f** *7/00*
U.S. Cl. 211—60 R **8 Claims**

A pair of pipe guides are removably mounted on the free ends of parallel pipe racking fingers for guiding pipes into a

slot between the fingers. The pipe guides fit over the ends of the fingers and include guide members secured at one end to



base members, from which they diverge outwardly away from the intervening slot to form a wide tapered entrance to the slot.

3,815,758

BASKET FOR A BOTTLE WASHING MACHINE

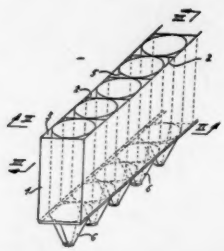
Albert Emile Isidore Marcel Vandergeeten, Brussels, Belgium, assignor to Vickers-Vandergeeten Societe Anonyme, Brussels, Belgium

Filed Nov. 24, 1970, Ser. No. 92,411

Claims priority, application Belgium, Nov. 25, 1969, 742164

Int. Cl. A47b *73/00*; B67c *1/16*

U.S. Cl. 211—74 **5 Claims**



A bottle washing machine basket having a plastics lining including rectangular metal boxes (1) into each of which there is driven a liner (5) of a plastics material provided with a nose (6); the diameter of the liner is slightly larger than the inside width of the compartment into which it is inserted so that a slight deformation is required to drive the liner home and the liner is automatically clamped (FIG. 1).

3,815,759

INCLINABLE JIB FOR HOISTING AND TRANSPORTING LOADS, IN PARTICULAR FOR CRANES

Maurice Gallay, 151 Boulevard de Chinon, Joue Les Tours (Indre et Loire), France

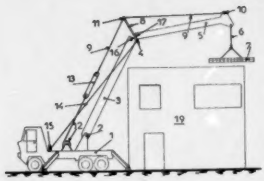
Filed Sept. 12, 1972, Ser. No. 288,318

Claims priority, application France, Sept. 15, 1971, 71.33992

Int. Cl. B66c *23/00*, *23/62*

U.S. Cl. 212—8 A **9 Claims**

An inclinable jib having a first beam with one end that is fixed to a lower king-pin to form a jib foot while the other end of the jib foot is pivotally connected to the base of a second beam which constitutes a jib head. A fixedly positioned winch is connected by means of a cable to the free end of the jib head to control the variations of inclination of the jib head and jib foot. A constant length sling has one end fastened to a fixed point while the other end is fastened to the jib foot with stop



means in one embodiment being provided on the jib foot to make it mechanically integral with the jib head when the same is raised to a given position whereby the single winch may operate both jib foot and jib head in the selected manner. Various alternative embodiments including multiple arrangements of pulleys are provided to achieve the desired results.

3,815,760

BOOM EXTENSION CONTROL SYSTEM

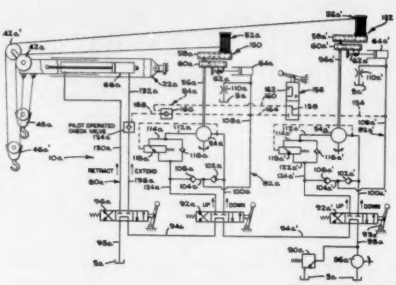
Oliver T. Nephew, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 10,961, Feb. 12, 1970, Pat. No. 3,721,350.

This application Aug. 31, 1972, Ser. No. 285,290

Int. Cl. A47f *7/00*

U.S. Cl. 212—55 **7 Claims**



A boom extension control system for employment with hydraulically extensible booms having hydraulic load lifting cable winches effective to provide an interlock between the boom and winch controls whereby extension of the boom is prevented until the winch is operated.

3,815,761

GRIP ACCESSORY FOR REMOTE-CONTROL MANIPULATOR TONGS

Milton F. Adam, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

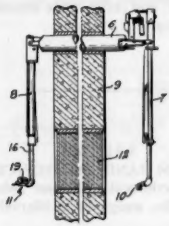
Filed Mar. 2, 1973, Ser. No. 337,324

Int. Cl. B25j *3/00*

U.S. Cl. 214—1 CM **8 Claims**

A master-slave manipulator includes an activator handle and tong assembly interconnected by mechanical transmission

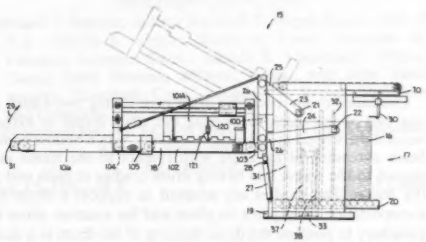
elements for imparting the movement of the handle to the tongs. A supplementary power unit is mounted on the tong assembly to provide a controlled tong grip when engaged, but is capable of being disengaged to permit unimpeded operation of the tongs from the activator handle.



3,815,762
AUTOMATIC SHEET FEEDER

Kenneth E. Hoke; George R. Cunningham, and Jerrold W. Greene, all of Marion, Ind., assignors to Greene Line Manufacturing Corporation, Marion, Ind.

Filed Mar. 26, 1973, Ser. No. 344,900
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **9 Claims**



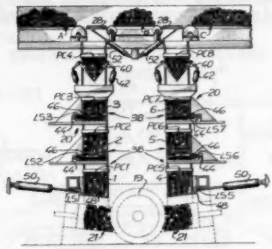
An apparatus for feeding sheets from a stack onto a conveyor. The stack is supported by a vertically movable platform which is positioned beneath horizontally movable pushing means. The means pushes sheets from atop the stack onto an adjacent conveyor which is telescopically constructed. The conveyor is pivotally mounted to allow positioning of the conveyor distal end allowing the conveyor to be swung upwardly during non-use. The means includes a pushing arm slidably mounted in the vertical direction which has a horizontal portion resting atop the stack and a vertical portion positioned adjacent the stack. An indicator signals the vertically movable platform when the top sheet on the stack is at a predetermined height.

3,815,763
GRINDER FEEDING SYSTEM

Georges Biloco, Plessisville, and E. Peter J. Hooper, both of Brantford, Province of Ontario, Canada, assignors to Forano Limitee, Plessisville, Quebec, Canada

Filed Feb. 24, 1972, Ser. No. 228,952
Int. Cl. B65g *47/44, 65/32*
U.S. Cl. 214—16 R **3 Claims**

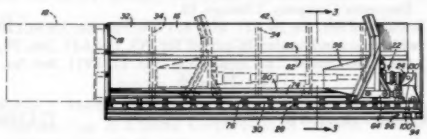
A system for feeding a grinder having at least one pocket for receiving logs to be grounded. The system comprises a magazine located above the grinder pocket for storing logs to be fed into the grinder pocket, a conveyor system located above the grinder for feeding logs to the grinder, and a gate located in the conveyor system right above the magazine for discharging logs into the magazine. The magazine includes a plurality of loading boxes located one above the other and each including a gate for permitting one box to discharge into the box below.



3,815,764
LOAD BODY WITH LOAD COMPACTING AND EJECTING BLADE

William C. Gilfillan, Nesquehoning, and Saul R. Spector, Pottsville, both of Pa., assignors to East Coast Equipment Corp., St. Clair, Pa.

Filed June 21, 1972, Ser. No. 264,829
Int. Cl. B60p *1/00*
U.S. Cl. 214—82 **9 Claims**



An upwardly opening load body including first and second ends and having an openable end gate at its first end and a load ejecting blade positioned within its second end for movement toward and away from the first end of the load bed. The blade may be utilized to eject a load from the load body or bed when the end gate is open and may also be utilized to compact a load within the body against the end gate when the latter is closed. The body includes upstanding side walls between which the ejecting and compacting blade is received and the side walls define corresponding longitudinal guideways in which followers carried by the corresponding sides of the ejector blade are guidingly received, the engagement of the blade supported followers in the side wall guideways insuring proper centering of the blade between the side walls and resisting spreading of the side walls due to compaction of a load therebetween.

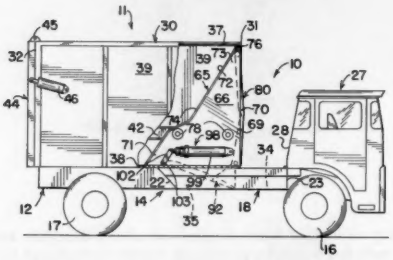
3,815,765
MATERIAL TRANSPORT

Raymond L. Moser, Tremont, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 25, 1973, Ser. No. 354,450
Int. Cl. B60p *1/00*
U.S. Cl. 214—82 **12 Claims**

A material transport providing a material receiving body having a forwardly disposed loading end and a normally closed rearward ejection end including a pusher mechanism disposed transversely of and reciprocably mounted within the material

receiving body. The pusher mechanism includes a pair of members which are relatively movable between a first position providing an opening therebetween for admitting material into the material receiving body through the pusher mechanism and a second position forming a substantially continuous wall.



A power actuating device is operatively associated with the pusher mechanism for selectively moving the pair of members between the first and second positions and for selectively reciprocating the pusher mechanism between the loading and ejection ends of the material receiving body.

3,815,766

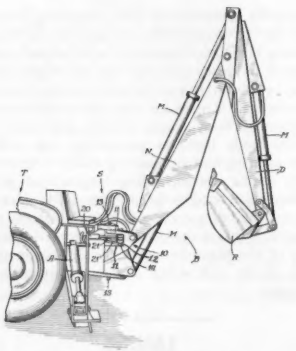
BACKHOE SWING MECHANISM

Ernest C. Carlson, Schwetzingen, Germany; Andrew Brudnak, Jr., Oak Lawn, Ill.; Rudolph E. Yeh, Elmhurst, Ill., and Ronald F. Sardiga, Chicago, Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 34,227, May 4, 1970, Pat. No. 3,630,120, which is a continuation-in-part of Ser. No. 794,637, Jan. 28, 1969, abandoned. This application Mar. 11, 1971, Ser. No. 123,460

Int. Cl. B66f *9/00*

U.S. Cl. 214—138 R **12 Claims**



An apparatus for converting rectilinear motion to rotational motion about a first axis having two pivotal members fixed about and rotatable with respect to each other and to the first axis, two hydraulic motors interconnected between said pivotal members, a source of fluid power supply connected to each hydraulic motor by conduit means, directional flow control means for selectively delivering fluid power to the hydraulic motors, sequence valve means for sensing the position of the hydraulic motors and for directing flow to aid in obtaining a relatively constant torque output and angular velocity, bleeder valve means for reducing hydraulic input energy when the pivotal member is near the end of its rotation and for maintaining a maximum velocity potential throughout the rotational movement, and relief valve means for additionally controlling torque output.

3,815,767

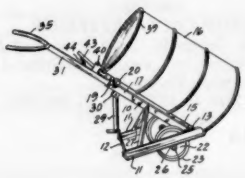
DRUM HANDLING DEVICE

Harold E. Lund, Northbrook, Ill., and John F. E. Ericson, North Seminole, Fla., assignors to Marvel Industries, Inc., Evanston, Ill.

Filed Nov. 6, 1972, Ser. No. 303,967

Int. Cl. B62b *1/06*

U.S. Cl. 214—383 **13 Claims**



Combined drum truck and drain rack having two wheels at one end of the truck supporting the truck frame to extend beyond the wheels in opposite directions, with a hollow cradle beam extending at an angle with respect to the frame and braced to the frame and having drum cradles at each end of the frame. The cradles are adapted to support a drum for transportation from place to place and for rotation about its periphery to position the drain opening of the drum in a drain position, when the frame is tilted into position to drain fluid from the drum. A leg pivoted to the cradle beam is provided to support the frame and beam in a drain position. A slip handle carrying a pair of gripping jaws is telescopically fitted in the hollow beam with the gripping jaws disposed above the drum. The slip handle may be moved downwardly within the beam to engage the gripping jaws carried thereby within and beneath the bead of the drum and tilt the frame upwardly and thereby lift the drum about the axes of the wheels and transport the drum from place to place.

3,815,768

PANEL TRAILER

Wayne M. Goodwin, 2813 Lombardy La., Dallas, Tex. 75220

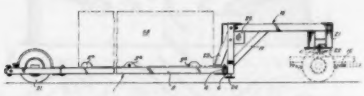
Filed Jan. 3, 1972, Ser. No. 214,708

Int. Cl. B60p *3/00*

U.S. Cl. 214—390 **11 Claims**

A trailer for hauling wall panels, containers, palletized loads or the like comprising a transverse expandable front member with side members pivotally attached at opposite ends thereof and guide members pivotally attached at the rear ends of the side members. The guide members are mounted on wheels and a closure member is pivotally attached to the rear end of one of the guide members and disengageably attached at the other end to the outer end of the other guide members. Hydraulically actuated means is employed to pivot the guide

means relative to the side members to move rear ends of the side members outwardly to deposit the rear end of a load and the front member may then be expanded to disengage the



front end of the load. An end of the closure member may then be disengaged permitting movement of the trailer away from the deposited load.

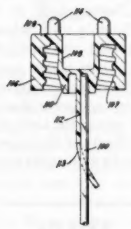
ERRATUM

For Class 215—1 see:
Patent No. 3,815,865

3,815,769
MOLDED PLASTIC CAP

Edward J. Rapoza, Butler; Maxwell E. Siegel, Sussex, both of N.J.; Weems E. Estelle, Southport, Conn.; Pasquale M. Petrucci, Orange, Conn.; Joseph S. Linarducci, Wilton, Conn.; John Hamma, Milford, Conn., and John Montgomery, Trumbull, Conn., assignors to Becton, Dickenson and Company, East Rutherford, N.J.

Division of Ser. No. 15,469, March 2, 1970. This application Aug. 18, 1972, Ser. No. 281,755
Int. Cl. B65d *51/00*
U.S. Cl. 215—38 R **3 Claims**

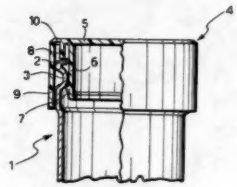


A blood testing system which includes a colorimeter for observing the light transmission characteristics of a reacted blood sample to determine the concentration of a particular component. The colorimeter includes a lamp, a sample holding well, a photocell, and a meter having a needle to indicate the output of the photocell. A removable module is provided which is adapted to plug into the circuitry of the instrument and adjustably calibrate the instrument for a particular blood determination. The cuvette containing the reagent required for the blood determination is provided with a molded plastic cap which is designed to retain a capillary within the cuvette when the cap is attached. For this purpose, the cap includes an integral depending flap having an aperture therethrough, the aperture being designed to threadedly receive the capillary.

3,815,770
CLOSURE DEVICE WITH A BREAKABLE SEAL FOR BOTTLES OR LIKE CONTAINERS

Piergiacomo Guala, Alessandria, Italy, assignor to Societa' Angelo Guala Di Piergiacomo E. Roberto Guala & C.S.A.S., Alessandria, Italy

Filed Nov. 6, 1972, Ser. No. 303,892
Int. Cl. B65d *41/48*
U.S. Cl. 215—253 **2 Claims**

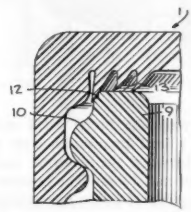


A bottle closure device is according to this invention moulded in a single piece of plastics material and has an inner tubular wall which fits into the neck of the bottle, and an intermediate wall which rests on the mouth of the bottle. An external skirt which surrounds the bottle neck is connected to the remainder of the closure device by frangible elements which break when any attempt is made to pull the closure device from the bottle, leaving a removable plastics stopper in the bottle.

3,815,771
LINERLESS CLOSURE CAP

Walter J. Marks, Mississauga, Ontario, Canada, assignor to Anchor Cap & Closure Corporation of Canada, Limited, Toronto, Ontario, Canada

Filed June 7, 1972, Ser. No. 260,366
Int. Cl. B65d *41/04*
U.S. Cl. 215—344 **7 Claims**

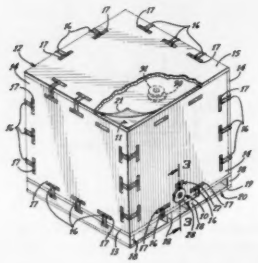


The invention is a closure cap for sealing glass or plastic containers. The one piece closure cap is characterized by having integral sealing means formed as a portion of the inner surface of the cap for providing a seal without the use of a separate liner such as cut liners or flowed-in liners normally used in closure caps. The sealing means provided in the caps of this invention comprises downwardly extending sealing rings or members having tapered sealing surfaces for engaging corner portions of the container finishes and with additional sealing rings positioned to engage other spaced portions of the container finishes.

3,815,772
DRAIN PORT VALVE AND IMPROVED SHIPPING CONTAINER

Austin E. Elmore, 8519 E. Pasadena Ave., and Ernest A. Uhlmann, 4533 N. Scottsdale Rd., both of Scottsdale, Ariz. 85251

Filed July 24, 1972, Ser. No. 274,805
Int. Cl. B67c *3/00*
U.S. Cl. 217—3 BC **5 Claims**

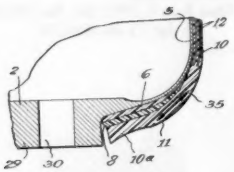


A drain port valve especially adapted for use with plastic bags or vessels which may be utilized for containing and transporting liquids.

3,815,773
CYCLIC PRESSURE VESSEL

Paul F. Duvall; W. Donald Humphrey; Thomas E. Timberlake, and Ralph F. Foral, all of Lincoln, Nebr., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 17, 1971, Ser. No. 144,351
Int. Cl. F25j
U.S. Cl. 220—3 **19 Claims**



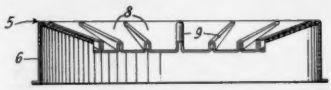
A lightweight, composite metal lined pressure vessel is made by providing a load distribution layer and a shear-slip plane interleaved between the external resin impregnated fiber housing and the metal liner. The pressure vessel is capable of withstanding repeated cyclic pressurization and depressurization. The vessel is impermeable to the fluids, gases and liquids, stored therein. Methods of making such pressure vessels require special processing techniques.

3,815,774
CONTAINER CONTENTS RETAINING DEVICE

Frank C. Olsson, East Lyme, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed May 24, 1972, Ser. No. 256,443
Claims priority, application Great Britain, Nov. 3, 1971, 51072/71
Int. Cl. B65d *5/42*
U.S. Cl. 220—24 GC **3 Claims**

The retainer comprises a plastic flange for the top of the waste container. The flange is sloped down and has folds in it so it can open and deflect down to pass material therethrough.

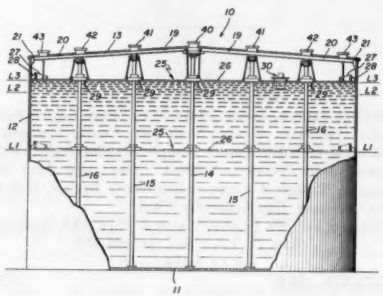


However, it will close in the opposite direction to retain compacted foam plastic refuse in the container.

3,815,775
COVERED STORAGE TANK WITH MEANS TO SUSPEND FLOATING ROOF WHEN NOT IN USE

Robert Winfield Strunc, Clarendon Hills, and Wray Bertram Young, Lombard, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed June 8, 1972, Ser. No. 260,983
Int. Cl. B65d *87/18*
U.S. Cl. 220—26 R **11 Claims**



An enclosed storage tank having a bottom, side wall and fixed-position roof, a floating-roof in the tank, means to releasably secure the floating-roof, when not in use, in the upper part of the tank near and beneath the fixed-position roof, and access means from above and through the fixed-position roof to provide communication with the means to releasably secure the floating-roof so that the floating-roof can be secured in the upper part of the tank near the fixed-position roof or released to float freely on liquid in the tank.

The access means can be a plurality of closeable ports in the roof.

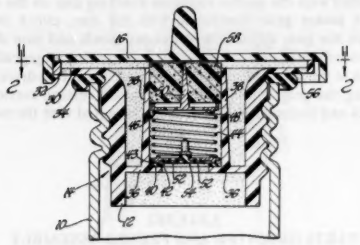
3,815,776
GAS CAP ASSEMBLY

Robert E. MacMillan, Allentown, Pa., assignor to McCord Corporation, Detroit, Mich.

Filed June 26, 1972, Ser. No. 266,106
Int. Cl. B65d *41/04*
U.S. Cl. 220—39 R **20 Claims**

A gas cap assembly is provided for the filler tube of a vehicle gas tank including a clutch coupling a closure member with a manually graspable control member. A plurality of radially deflectable pawls integral with the closure member and a plurality of protrusions, having surfaces engagable with the pawls, integral with the control member coact in the operation of the clutch. When the cap assembly is screwed onto the filler tube, the radially deflectable pawls are intermittently deflected to allow 360° relative rotation between the closure member and the control member, if the torque applied to the control member exceeds a predetermined maximum. In this manner, the torque that can be applied to tighten the closure

member in the filler tube is limited to the predetermined maximum. When the cap is removed from the filler tube, the pawls engage the surfaces of the protrusions in a manner preventing relative rotation between the closure member and the control member irrespective of the torque applied to the control



member; the pawls of the clutch are not deflected by the protrusions when the cap is removed. The cap assembly also includes two valves. An air inlet valve permits air to enter the gas tank as gas is pumped out. A pressure release valve insures against excessive pressure build-up in the tank.

3,815,777

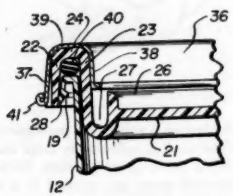
REUSABLE PLASTIC CLOSURE WITH RING SEAL

Roy G. Churan, Oak Lawn, Ill., assignor to Vulcan Plastics Inc., Addison, Ill.

Filed Feb. 3, 1972, Ser. No. 223,138

Int. Cl. B65d *53/00*

U.S. Cl. 220—46 R **1 Claim**



A closure and ring seal combination which includes, generally, a closure having an annular inverted U-shaped channel about its top wall structure into which the upper edge of the open end container is received. This upper edge of the container has a bead or curl on it, and the outer annular wall of the U-shaped channel has interlocking means on its interior surface which interlock with the curl on the container to removably affix the closure to the container. The ring seal is of metal and is affixed to the container and closure by crimping the annular outer flange against the annular outer wall of the U-shaped channel in a fashion such as to forcibly urge the interlocking means into tight locking engagement beneath the curl. The ring seal is secured to the container and the closure by this crimping action, but its edge is not folded under the curl so that the ring seal can be removed far easier than in the past.

3,815,778

TRASH BAG RETAINER

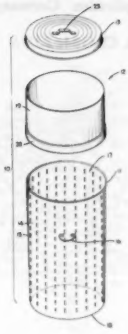
Eugene D. Martin, 312 Granada Rd., Bloomington, Ill. 61701

Filed June 19, 1972, Ser. No. 263,841

Int. Cl. B65d *25/14*

U.S. Cl. 220—65 **3 Claims**

An apparatus for holding a flexible and collapsible plastic trash bag. A rigid trash receptacle receives the plastic trash bag and includes a plurality of apertures along the side walls of the receptacle to allow air between the bag and receptacle to escape as the bag is filled. The top portion of the bag is folded over the upper rim of the receptacle and is secured thereto by a retainer collar which is removably mountable onto the rim.



The collar extends above the receptacle to hold trash stacked above the rim which will be subsequently compressed below the rim. A lid is provided for closing the top opening of the retainer collar or receptacle.

3,815,779

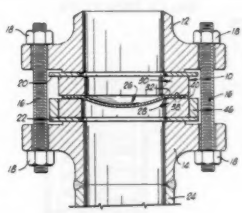
SAFETY PRESSURE RELIEF DEVICE

Gary J. Ludwig, and Loren E. Wood, both of Tulsa, Okla., assignors to Black, Sivalls & Bryson, Inc., Tulsa, Okla.

Filed Mar. 17, 1972, Ser. No. 235,704

Int. Cl. F17b *1/14*

U.S. Cl. 220—89 A **6 Claims**

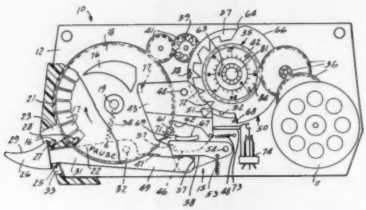


The present invention relates to an improved safety pressure relief device of the type having a rupture disk supported between a pair of annular supporting members adapted to be clamped between a pair of conventional pipe flanges. The rupture disk includes an annular flat flange portion and each of the annular supporting members have annular flat portions to coact with and support the rupture disk. Means are provided attached to the supporting members for aligning the supporting members, centering the rupture disk therebetween and preventing the rupture disk from being installed improperly. One of the supporting members includes an annular spacing member attached to the outside periphery thereof so that when the safety pressure relief device is clamped between conventional pipe flanges, the device is automatically centered therein.

3,815,780
CLOCK HAVING MEANS FOR PERIODICALLY DISPENSING AND CONTROLLING THE RELEASE OF ARTICLES

Herbert Bauer, 7742 St. Georgen/Schwarzwald, Schultheissweg 2, Germany

Filed July 20, 1970, Ser. No. 56,435
Claims priority, application Germany, July 19, 1969, 1936816
Int. Cl. G04c *23/18*
U.S. Cl. 221—15 **5 Claims**

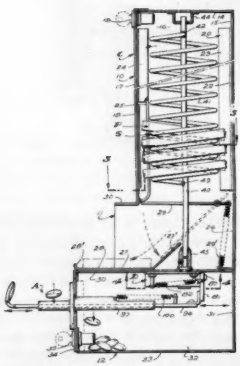


A clock having time-measuring means includes a pill-dispensing apparatus driven by the time-measuring means for dispensing a pill and for controlling release of the dispensed pill in a manner to regulate consumption of the pill so that the same may only be consumed during a preselected, pill-taking time interval. Means driven by the time-measuring means control access to the dispensed pill and actuate audible and/or visible signaling means to indicate whether a dispensed pill may be, should be or has been consumed.

3,815,781
VENDING MACHINE WITH IMPROVED AUGER CONVEYOR

Currie Armstrong, Los Angeles, and Clarence E. Christophersen, San Clemente, both of Calif., assignors to Armstrong, Currie, Los Angeles, Calif., by said Clarence E. Christophersen

Filed Nov. 16, 1972, Ser. No. 307,157
Int. Cl. B65g *33/04*
U.S. Cl. 221—75 **4 Claims**

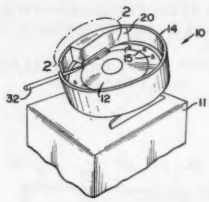


A vending machine including an elongate vertical rotary auger-type item carrier arranged in a cabinet between a pair of elongate vertical, laterally spaced, laterally inwardly opening and opposed item guiding chutes, said carrier having a central shaft and a longitudinally extending helical, spring-like, element carried by the shaft and arranged with one-half of each helical turn projecting freely into one chute, and the other half of each turn projecting freely into the other chute, said half turns occurring between vertically spaced items in the chutes, a discharge opening in the cabinet below the chutes and the lower end of the carrier, indexing drive means operable to intermittently rotate the carrier 180° and including a drive shaft connected with the carrier shaft, an indexing disc on the drive shaft, a pinion gear concentric with the disc, check means between the gear and disc with related pawls and stop shoulders spaced 180°, a latch means including a dog engageable in notches in the disc and spaced 180°, a reciprocating drive rack engaging the gear, a magnetic latch means release carried by the rack and linear actuating means connected with the rack.

3,815,782
PARTS ORIENTER AND FEEDER ASSEMBLY

Paul Marcus Miller, Largo, Fla., assignor to Tangen Drives, Inc., Clearwater, Fla.

Filed Jan. 12, 1973, Ser. No. 323,070
Int. Cl. B65h *9/04*
U.S. Cl. 221—160 **2 Claims**



A headed parts feeder is shown for parts having a head and shank in which the head is sufficiently large and flattened so that it has stability in the inverted position. With the shank up, generally, the headed parts are rotated in a rotary conical member having a circular wall surrounding the same. A tangential plow engages the wall to direct the parts away from the wall to an inclined ramp which carries the parts upwardly. A bar member is positioned above the ramp and overlying the same which engages either heads or shanks which are not properly oriented. The base of the inclined ramp is angled downwardly toward the other wall portion of the rotary feeder. Optionally, the bar member may be extended, thereby rejecting all parts and recirculating the same when a shut off is desired.

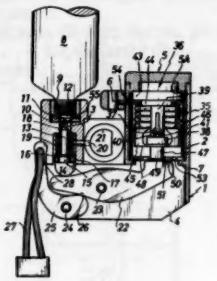
3,815,783
GAS FILLING APPARATUS FOR INFLATABLE FLOATS

Michiaki Hirata, Tokyo, Japan, assignor to Tokyo Toyo Rubber Industry Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1972, Ser. No. 240,386
Claims priority, application Japan, Apr. 3, 1971, 46-24482
Int. Cl. B63c *9/14*
U.S. Cl. 222—5 **5 Claims**

A gas filling apparatus for an inflatable float which comprises a compressed gas cartridge, a piercing pin for piercing the sealing cap of said gas cartridge to open it, a driving lever for driving the piercing pin, a manual operating lever and an automatic actuation mechanism which will automatically

operate when submerged in water to actuate said driving lever, characterised in that said piercing pin driving lever is in-



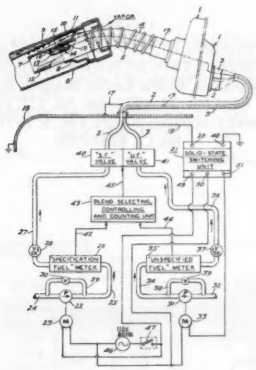
terposed between said piercing pin and said manual operating lever, and said automatic actuation mechanism is fitted in the form of a replaceable cartridge.

3,815,784

DISPENSING NOZZLE ARRANGEMENT PROVIDING ELECTRICAL LOCKOUT

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 14, 1972, Ser. No. 280,612
Int. Cl. B67d *5/04*
U.S. Cl. 222—26 **10 Claims**



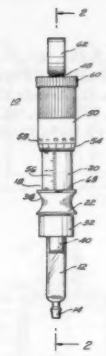
Nozzle arrangement which positively prevents the dispensing of unspecified fuels (e.g., leaded fuels) into "-specification" automobiles which require "specification fuel" (e.g., non-leaded fuel) exclusively, while permitting the dispensing of unspecified fuels into other, "non-specification" automobiles. Separate pumping means are utilized for unspecified fuel and for specification fuel. The special fuel filler inlets of specification automobiles are modified (made special) to prevent use therein of a dispensing nozzle spout of standard configuration, a non-standard spout being employed for such automobiles. This non-standard spout incorporates an electrical lockout arrangement which functions to automatically render the unspecified-fuel pumping means inoperative whenever the non-standard spout is being utilized for dispensing into a special fuel filler inlet. Under other dispensing conditions, the unspecified-fuel pumping means is operative.

3,815,785

MICROMETRIC DISPENSER WITH CALIBRATION MEANS

Roger Gilmont, Douglaston, N.Y., assignor to Roger Gilmont Instruments Inc., Great Neck, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,926
Int. Cl. A61m *3/00*
U.S. Cl. 222—46 **17 Claims**



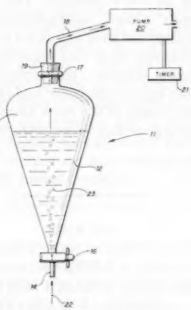
A pump-type dispenser in which the degree of movement of the piston, and hence the volume of liquid dispensed on each cycle of operation is adjustably controlled by a structure mounted on the piston rod. The dispenser is provided with means for adjusting the zero setting of the calibrated indicia.

3,815,786

SLURRY DISPENSING APPARATUS HAVING VACUUM CONTROLLED DISCHARGE

James B. McCallum, Plymouth, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 20, 1972, Ser. No. 316,775
Int. Cl. B67d *3/00*
U.S. Cl. 222—70 **8 Claims**



Apparatus for controllably dispensing metered amounts of fluid. The apparatus includes a generally funnel shaped container filled with fluid and having a dispensing port positioned adjacent its lower end. A vacuum pump or the like is also coupled to the container adjacent its upper end for the purpose of withdrawing air from the container. When the pump is operating, air is drawn upwardly into the container through the port thus preventing fluid from dispensing out of the port. When it is desired to dispense fluid from the container, the vacuum pump is merely inactivated to terminate the upward flow of air and permit the fluid to dispense through the port by gravity.

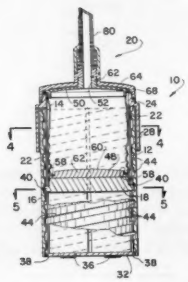
Appropriate control structure is also provided for turning the pump on and off at the appropriate times to permit metered amounts of fluid to be automatically dispensed at precise intervals. The apparatus is particularly effective in dispensing abrasive slurry in optical surfacing operations although it finds application in a wide variety of fluid dispensing activities.

3,815,787

DISPENSING DEVICE

Henry J. Spies, 6165 Estes St., Arvada, Colo. 80004

Filed Jan. 5, 1973, Ser. No. 321,135
Int. Cl. B65d *35/30*
U.S. Cl. 222—95 **3 Claims**



A dispensing device for liquids or other flowable substances includes a receptacle adapted to hold a collapsible cartridge in which a charge of the substance is retained and an outer hand-controlled member adapted upon rotative movement to positively drive a carriage through the receptacle to compress the cartridge and force the substance through a unique nozzle assembly in a cap on the receptacle. The nozzle assembly includes a normally closed, spring-loaded pressure-sensitive dispensing slide disposed over a neck on the receptacle cap for axial sliding movement such that upon rotative movement of the hand-controlled member, the substance in the cartridge will exert pressure against the outer end of the dispensing slide to move the slide axially of the neck allowing the substance to flow from a discharge orifice in the dispensing slide.

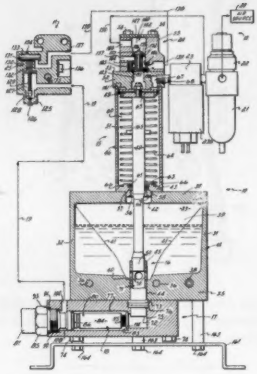
3,815,788

THERMOPLASTIC APPLICATOR INCLUDING A REMOVABLE FILTER

Alan B. Reighard, Bay Village, and Simon Z. Tamny, Lorain, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 24, 1972, Ser. No. 299,838
Int. Cl. B67d *5/60*
U.S. Cl. 222—146 HE **11 Claims**

An applicator system for melting thermoplastic material and supplying the molten or liquid material under pressure and at a controlled temperature to an applicator head or gun. The material is heated in a reservoir from which it is pumped through a manifold block to the applicator gun by a single-acting, sleeve-type air motor driven piston pump. Internally of the manifold block, there is a combination filter, check valve, relief valve cartridge which may be installed or removed from



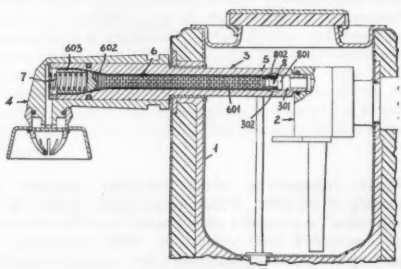
the block as a unit but which also has the filter so mounted that it is separately removable for cleaning or replacement purposes.

3,815,789

CONTINUOUS MACHINES FOR THE INSTANTANEOUS PRODUCTION OF WHIPPED CREAM

Poerio C. Carpigiani, Anzola Emilia, Bologna, Italy

Filed Jan. 27, 1972, Ser. No. 221,326
Claims priority, application Italy, Feb. 5, 1971, 12478/71
Int. Cl. B01f *7/04*
U.S. Cl. 222—190 **3 Claims**



The core of the emulsifying homogenizer is axially shiftable within its tubular shell from a position in which it intercepts the flow through the emulsifying homogenizer to a position in which it clears a throughflow passage. A flow intercepting valve is provided at the end of the shell upstream of the emulsifying homogenizer whose opening is promoted by a predetermined axial shifting of the core of the homogenizer in the direction in which it clears the throughflow passage.

3,815,790

PRECISION LIQUID PIPETTING DEVICES

Donald M. Allen, Pinole, and Thomas E. Lee, Lafayette, both of Calif., assignors to Kensington Scientific Corporation, Emeryville, Calif.

Filed Sept. 18, 1972, Ser. No. 289,996
Int. Cl. G01f 13/00
U.S. Cl. 222—309 7 Claims

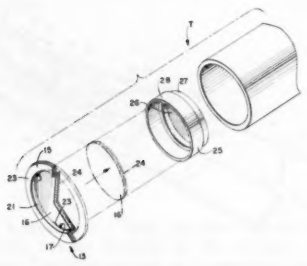
Precision liquid pipetting devices for use with disposable pipettes having improved means for adjusting the stroke of the plunger within the pipette and for precisely calibrating the volumetric capacity.

3,815,791

HERMETICALLY SEALED TUBE FOR CONTAINING AND DISPENSING VISCOUS MATERIALS

James Elton Clark, Orlando, Fla., assignor to Cantop Incorporated, Orlando, Fla.

Filed Apr. 26, 1973, Ser. No. 354,546
Int. Cl. G01f 3/04
U.S. Cl. 222—326 7 Claims



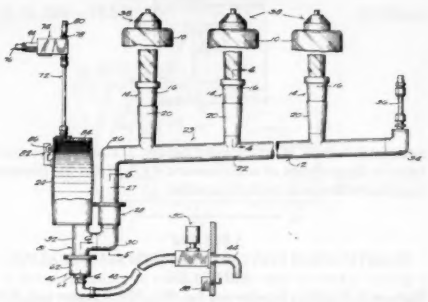
A hermetically sealed tube for containing and dispensing viscous materials with a pressure gun or the like, including hermetically sealed closure means on opposite ends of the tube to prevent setting or leakage of a viscous material contained in the tube and including a plunger within the tube adjacent one end thereof and spaced inwardly from one of said closures, said one closure fracturable by said pressure gun or the like and movable into engagement with said plunger to forcibly dispense the contents of the tube through the other end thereof.

3,815,792

APPARATUS FOR DISPENSING LIQUID FROM A LIQUID SUPPLY MANIFOLD

John F. Petranyi, Oak Creek, Calif., assignor to DEC International, Inc., Madison, Wis.

Filed Nov. 7, 1972, Ser. No. 304,367
Int. Cl. B67d 5/52
U.S. Cl. 222—373 12 Claims



A liquid dispensing system including a liquid supply manifold connected to a liquid dispensing reservoir. A check valve is interposed between the manifold and the reservoir to permit liquid flow from the manifold to the reservoir and to prevent reverse flow from the reservoir to the manifold. A dispenser outlet is connected to the reservoir and a dispenser valve is provided thereat to control liquid flow from the dispenser outlet. A source of air under pressure is connected to the reservoir and a control valve is provided to alternately place the reservoir into communication with the source of air under pressure and then subsequently cut off the source of air pressure and place the reservoir into communication with the atmosphere. During the period the reservoir is placed in communication with the air under pressure, the liquid dispenser valve is opened to thereby cause a quantity of liquid to be dispensed from the reservoir out through the dispenser outlet.

The manifold assembly includes a plurality of liquid containers connected thereto with the container closest to the reservoir being at a lower elevation than the next adjacent container and so on up the line to the last container which is located at the highest elevation. The end of the reservoir adjacent the last container is open to the atmosphere. With this arrangement liquid flowing from the manifold to displace the liquid dispensed from the reservoir will be supplied first from the container at the highest elevation and then from the container at the second highest elevation and so on down the line to the container at the lowest elevation.

3,815,793

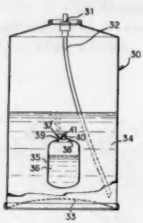
PRESSURIZED DISPENSER HOLDING MORE HIGHLY PRESSURIZED INTERNAL CONTAINER

Bruno P. Morane, Paris; Charles Paoletti, Aulnay sous Bois; Manlio Maurelli, Vaujours; Louis Merrien, Fontenay sous Bois, and Robert Sathicq, Villepinte, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 43,696, June 5, 1970, Pat. No. 3,712,501.
This application Aug. 21, 1972, Ser. No. 282,123
Claims priority, application France, June 10, 1969, 69.19182; Sept. 1, 1969, 69.29795
Int. Cl. B65d 83/14
U.S. Cl. 222—399 9 Claims

A container holding a pressurizing fluid comprises a resilient member to be positioned in the container wall and formed with a valve opening. A plug is positioned in the opening to normally close it, but the resilient member will flex to permit the release of fluid through the valve opening past the

plug in response to a predetermined difference between the pressure inside and that outside the container. The container is enclosed within an outer jacket holding a fluid to be

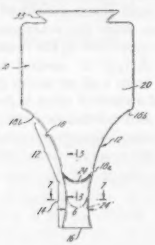


dispensed, which is maintained under a constant pressure equal to the pressure of said pressurizing fluid less the pressure required to flex said resilient member.

3,815,794
PLASTIC-FILM CONTAINERS WITH SELF-SEALING ORIFICES

Richard S. Carlisle, Beachwood Ln. Box 307, Thornwood, N.Y. 10580

Filed Mar. 2, 1972, Ser. No. 231,288
Int. Cl. B65d *37/00*
U.S. Cl. 222—491 **29 Claims**



The disclosed containers are formed of supple plastic films fused together face-to-face along continuous seams that converge in the fluid-discharge direction to form a spout. When part of the spout is distended by fluid contents, a seal forms between the films. Squeezing the container develops internal fluid pressure that causes release of the seal. Depending on the proportions of the spout, the seal is either self-restoring when pressure is relaxed, or the seal remains open until it is manually restored. The form of the spout also determines the character of the discharge, whether a continuing stream, or a limited-quantity discharge, or a fine jet that breaks up into a spray.

Adding a spout-pressing plate to a container having a self-restoring seal forms a novel dispenser.

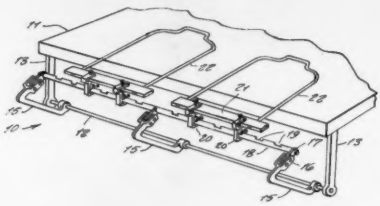
A guard applied to the spout can prevent unintended opening of the seal when the container is squeezed. The films that form the container can be shaped to provide a stable gusseted base.

In a variant, a container has a spout proportioned to form an especially secure seal across the discharge passage, which does not open in response to practical levels of internal pressure. Such a seal is rendered pressure-releasable, and it can even be released entirely, by lessening the distension of the spout walls. Both in this variant and where the seal is pressure-releasable, internal fluid pressure builds up when the container is squeezed in use or in handling. With both types of seal, the danger of developing wall-bursting stresses due to internal pressure is minimized by shaping all seams so as to be free of corners directed toward the interior of the container.

3,815,795
DEVICE FOR MASS PRODUCTION GARMENT STEAMING

Mihai Goldstein, 7239 Bergen Ct., Brooklyn, N.Y. 11234

Filed Sept. 12, 1973, Ser. No. 396,586
Int. Cl. A41h *5/00*
U.S. Cl. 223—70 **1 Claim**

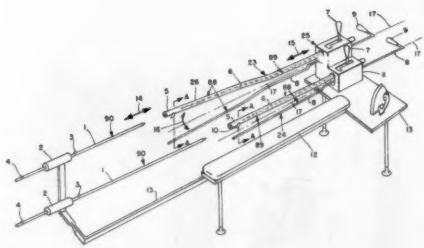


A pressing appliance for industrial use, and which includes a frame unit that is movable against a steaming table, the frame unit being designed to hold several garments at one time, such as sweaters, hot pants, or the like, so that mass production steaming is attained in order to increase production volume while saving on time.

3,815,796
APPARATUS AND METHOD FOR INVERTING AND PRESSING REVERSIBLE NECKTIE

Joseph A. Luceri, 8 Suncrest Rd., Andover, Mass. 01810

Continuation-in-part of Ser. No. 130,636, April 2, 1971, Pat. No. 3,744,057. This application July 10, 1973, Ser. No. 378,239
Int. Cl. D06c *15/00*
U.S. Cl. 223—82 **16 Claims**



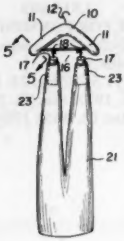
An apparatus is described which inverts a reversible necktie directly onto a work surface comprising a hollow tube, the work surface then expanding within the inverted necktie with a rotary type motion. The two face fabrics of the necktie are thus held taut in uniform tension with one another along the entire edge seam, while allowing pressing along the edge seam. A rounded pressing surface creates a soft, gentle, roll-like effect along the edge seams and eliminates any undesirable flat looking appearance to the necktie. A retractable, sharply pointed rod within the tubular pressing surface creates the sharp corners and tip of the necktie, while supported on the work surface.

3,815,797

SCUBA SUIT HANGER

James N. Schamber, Clearwater, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,703
Int. Cl. A47j 51/08
U.S. Cl. 223—88 1 Claim



A hanger unit for the storage of rubber scuba suits by suspension so as to accelerate rapid drying of the suit by maintenance of adequate air circulation inside of the suit jacket and pants. The use of this hanger avoids the danger of cracking or creasing of the rubber material in storage.

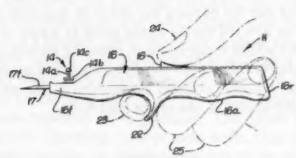
The hanger unit is designed with wide blades so as to increase the radius of curvature of the contact area between hanger blades and suit. A cross-bar fixed to the hanger blades suspends two bell-shaped members. Each of the ankle sections of the pants of the suit may be fastened about one of the bell-shaped members so as to suspend the pants in upside-down fashion. The bell-shaped members may be of hollow or solid configuration, and are slightly tapered to achieve a tight fit with the ankle sections of the scuba pants. The cross-bar fixed to the hanger may be fitted with notches or loops to separate the two bell-shaped members which support the pants.

3,815,798

BUTTON FASTENER

Bernard R. Lavitch, 16253 Lovett Pl., Encino, Calif., and Bernard H. Morry, 1085 Galesmore Ct., Westlake Village, Calif. 91361

Filed May 21, 1973, Ser. No. 362,473
Int. Cl. A41h 37/10
U.S. Cl. 223—102 6 Claims



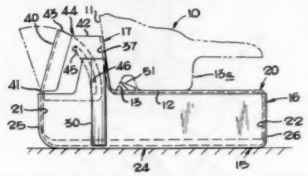
A button is secured to a fabric or other material using a resilient plastic stringer inserted by the inventive button fastening tool. The fastening tool is of simplified design to achieve both minimum cost and optimum ease of use. The tool housing includes a depending finger rest, a contoured grip and a push button slidingly mounted atop the housing. Placement of the forefinger against the finger rest limits forward movement of the fastening tool as the push button is thumb-advanced for stringer insertion. This cooperation enables one hand operation. Simplified assembly of the fastening tool is accomplished without screws or rivets, using a two piece molded plastic housing including recesses for receiving a unitary needle, and a push rod-push button assembly of unique configuration. The housing also includes storage for a protective needle cap.

3,815,799

LITTER CONTAINER IN AN AUTOMOBILE SEAT ASSEMBLY

Earl M. Trammell, Jr., c/o E.M.T. Enterprises, Inc. P.O. Box 435, St. Louis, Mo. 63166

Continuation-in-part of Ser. Nos. 875,753, Nov. 12, 1969, Pat. No. 3,598,232, and Ser. No. 881,415, Dec. 2, 1969, Pat. No. 3,625,347. This application Apr. 21, 1971, Ser. No. 136,063The portion of the term of this patent subsequent to Dec. 7, 1988, has been disclaimed.
Int. Cl. B60n 3/08, 3/10
U.S. Cl. 206—19.5 R 14 Claims



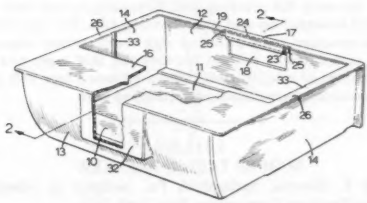
A litter container in an automobile seat assembly having a L-shaped casing with a bottom container portion fitting under the seat and an upstanding front container portion extending forwardly of and adjacent to the front seat side, an access opening being provided in the top of the front container portion. A latch means carried by the container moves up under loading of a resilient means to engage the seat and hold the container in place under the seat.

3,815,800

PORTABLE STORAGE AND CARRYING STRUCTURE

William Harold Monahan, Markham, Canada, assignor to Cameron-McIndoo Limited, Don Mills, Ontario, Canada

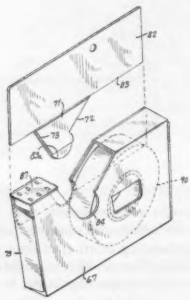
Filed Jan. 3, 1972, Ser. No. 214,560
Claims priority, application Canada, Aug. 13, 1971, 120499
Int. Cl. A45c 11/34
U.S. Cl. 224—45 N 10 Claims



In a portable structure which is intended to be used for the storage and carrying of items of school supplies and which comprises a rectangular base wall with upstanding front, rear and side walls projecting from the base wall, there is incorporated an upper wall disposed in opposed, parallel spaced relationship to the base wall and extending from the rear wall to a position between the rear wall and the opposed front wall so that, when the structure is being used for carrying purposes with the structure freely suspended by a carrying handle defined by an opening in the front wall, the upper wall substantially prevents items of school supplies within the structure from falling therefrom. This desirable result is enhanced where the rear wall is upwardly inclined in the direction from the upper wall to the base wall when the structure is in the above condition in which it is being used for carrying purposes. The front wall substantially prevents items of school

supplies from inadvertently falling from the structure when it is used for storage purposes substantially in the manner of a drawer with the base wall lowermost and horizontally disposed.

3,815,801
GUMMED TAPE DISPENSER CARTON
Ronald Perrin, Marshall, Mich., assignor to St. Regis Paper Company, New York, N.Y.
Filed Dec. 29, 1972, Ser. No. 319,459
Int. Cl. B26f *3/02*; **B65d** *85/67*
U.S. Cl. 225—47 **13 Claims**

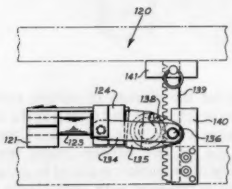


A dispenser for a gummed tape roll comprising a one-piece cardboard or equivalent blank of substantially rectangular contour, creased and bent along parallel crease lines into a substantially rectangular tube consisting of top, bottom and sidewall portions, and a closure flap adhered to one said portion, said sidewalls having oppositely disposed end closure flaps which are inwardly bent, overlapped and adhesively bonded together to form a rigid boxlike structure, said sidewalls having oppositely disposed, partially cut through roll-mounting tabs joined thereto along crease lines, said tabs being inwardly bent, overlapped and adhesively bonded together for rotatively mounting a gummed tape roll thereon, the top and contiguous sidewall portions of said structure being cut away for grasping and dispensing a tape end of a tape roll mounted on said roll mounting tabs, the top portion of said structure being provided with sharp cutting edges adjacent said cutaway portion for severing said tape; and the combination of said dispenser and a gummed tape roll rotatively mounted therein on said overlapped tabs.

3,815,802
SCORED TABLET BREAKER
Robert T. Stevens, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.
Filed Sept. 29, 1972, Ser. No. 293,714
Int. Cl. B26f *3/00*
U.S. Cl. 225—93 **5 Claims**

A tool for subdividing a scored medicinal tablet which comprises base means and a rigid ridelet projecting from said base, said ridgelet presenting an arcuate apex and providing fulcrum means to receive an opposing force applied between the portions of said scored tablet.

3,815,803
FEED DEVICE FOR FORMING APPARATUS
Ward A. Ames, Danville, Ill., assignor to Tridan Tool & Machine, Inc., Danville, Ill.
Division of Ser. No. 211,551, Dec. 23, 1971. This application Aug. 6, 1973, Ser. No. 386,224
Int. Cl. B65h *17/40*
U.S. Cl. 226—58 **2 Claims**

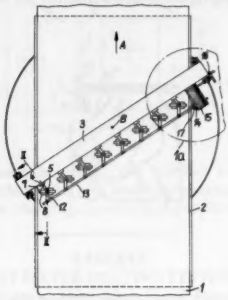


A feeding device for moving a sheet of material through a progressive die apparatus which forms holes into the sheet. In one embodiment of the feed device, a feed bar is slidably mounted in the direction of feed and has a plurality of upwardly biased feed fingers which project through the formed holes in the sheet. The bar is pivotally connected to a link which in turn is connected to means for converting the vertical motion of the forming apparatus press into reciprocating horizontal motion of the feed bar. One embodiment of the means includes a rack connected to the press which is engaged with a pinion mounted on a rotatable shaft. A crank is connected to an end of the shaft and is pivotally connected to the link. Another embodiment of the means includes a member projecting downwardly from the press being pivotally connected to an end of the link. A second guide link is connected to the base of the feeding device and is also connected to the downwardly extending member. The feeding device has either a single feed bar for moving the sheet of material during the downward or upward stroke of the press or a pair of feed bars are provided which reciprocate in opposite directions so as to move the sheet during both the downward and upward stroke of the press. A power cylinder is provided in one embodiment to control the stroke of one of the feed bars.

3,815,804
PARALLEL GUIDING SYSTEM
Peter Aka, Hamburg, Germany, assignor to Fried. Krupp Gesellschaft mit be schrankter Haftung, Essen, Germany
Filed Mar. 2, 1973, Ser. No. 337,385
Claims priority, application Germany, Mar. 3, 1972, 2210274
Int. Cl. B65h *23/32*
U.S. Cl. 226—199 **4 Claims**

A device for the parallel guiding of webs and material to be cut, especially of steel cord for use in connection with the manufacture of pneumatic tires, according to which a plurality of freely rotatable porcupine rollers are substantially uniformly distributed over the width of a table and have their

cylindrical circumferential surface provided with radially protruding pointed pins for engaging the material to be cut

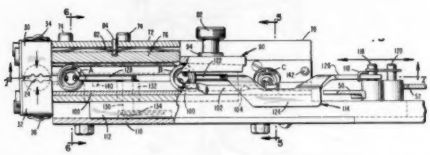


when the latter passes over said table so as to prevent the material being cut from deviating laterally.

3,815,805
APPARATUS FOR ATTACHING FASTENERS TO A GARMENT IN REGISTRATION

Joseph Oscar Charles Beneteau, Riverside, Ontario, Canada, assignor to Textron Inc., Providence, R.I.

Filed June 5, 1972, Ser. No. 261,880
Int. Cl. A41h *37/10*
U.S. Cl. 227—119 **6 Claims**



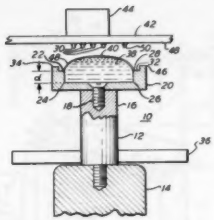
A feed arrangement is disclosed for feeding two component fasteners, such as buttons, snaps and the like having a pronged head element and a backing element, to an apparatus in such fashion that the design on the obverse of the head elements will be in register at the time the fasteners are attached to a garment by the apparatus. The feed arrangement for each element includes a hopper-chute assembly, a guide channel and a two-step feed means. The guide channel and drive means are arranged to receive elements from the chute and move them in two steps to a setting station where an anvil and ram secure the elements together on a garment. The guide channel is formed by two opposing, spaced side walls, one of which is spring biased towards the longitudinal axis of the channel and presents a roughened surface toward the channel. The difference in friction between the elements and each of the side walls causes the elements to rotate as they are moved in the feed direction until further rotation is prevented by a portion of the element engaging a pusher arm of the drive means.

3,815,806
DESOLDERING FIXTURE

Roy S. Paxton, Hasbrouck Heights, N.J., assignor to The Singer Company, Little Falls, Ohio

Filed Nov. 24, 1972, Ser. No. 309,340
Int. Cl. B23k *1/00*
U.S. Cl. 228—19 **5 Claims**

A fixture is described herein which is suitable for soldering or desoldering multiple electrical connections as might be found on a printed circuit board or on a printed wiring tape. The disclosure includes in combination a container made from a non-wetting material such as 303 Stainless Steel, connected to a source of heat such as a standard soldering iron or small solder pot. The container includes a cavity into which the solder is placed. This cavity is surrounded by a reservoir ledge

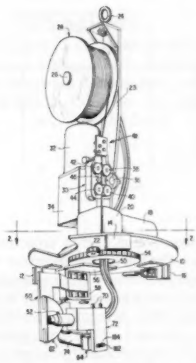


which acts to restrain the overflow of solder when the leads to be soldered or unsoldered are immersed therein.

3,815,807
AUTOMATIC WELDING APPARATUS

John E. Bartley, Aptos, Calif., assignor to Zeta International Engineering, Inc., Santa Clara, Calif.

Filed Aug. 18, 1972, Ser. No. 281,960
Int. Cl. B23k *5/00*
U.S. Cl. 228—29 **10 Claims**

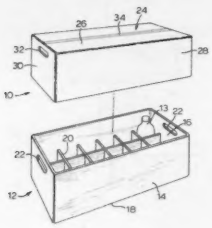


An automatic welding apparatus for cylindrical members of moderate internal diameter includes a support platform assembly carrying several bearing pads which are manually urged to radially extended positions to engage the inner surface of the cylinder and fix the platform in place. Mounted on and above the platform are a drive motor, a welding wire supply drum and a welding wire feed device. Rotatably mounted beneath the platform and centrally of it is a driven gear which is rotated by the drive motor. The driven gear mounts a carrier which through two intermediate members and a welding head support imparts a circular weld path motion to the welding head. One intermediate member is connected to the carrier for adjustment axially of the cylinder, the other intermediate member is pivotally attached to the first to vary the inclination of the welding head and the welding head support is guided on the second intermediate member for selected traversing movement back and forth relative to the weld path.

3,815,808
PACKAGING STRUCTURE

Arthur K. Bunnell, Etobicoke, Ontario, Canada, assignor to Carling O'Keefe Limited, East Toronto, Canada

Filed June 8, 1972, Ser. No. 261,075
Int. Cl. B65d *5/48, 5/54*
U.S. Cl. 229—15 **9 Claims**

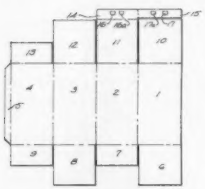


A packaging structure for bottles is provided including a reusable bottle carrying tray and a disposable thin cardboard sleeve closing the open top of the tray and engaging the outer walls of the tray.

3,815,809
CARTON WITH INTEGRAL REINFORCED HANDLE

Chester F. Walters, Middletown, Ohio, assignor to The Interstate Folding Box Company, Middletown, Ohio

Filed June 21, 1972, Ser. No. 264,934
Int. Cl. B65d *5/08, 5/46*
U.S. Cl. 229—37 E **10 Claims**



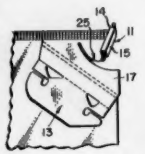
A one-piece paperboard carton structure having a reinforced carrying handle, the carton structure being particularly suited for packaging relatively large consumer sales units of bulk materials and having enclosing body walls and a multiple thickness carrying handle integrally connected to one of the body walls, with a plurality of the end closure flaps adjoining the handle acting to reinforce and strengthen the structure so as to resist peeling and tearing forces encountered when the filled carton is carried by its handle.

3,815,810
OPENING AND RE-SEALING DEVICE FOR BAG CONTAINERS

Lester R. Wellman, 110 Lakewood Pl., Highland Park, Ill. 60035

Filed July 7, 1972, Ser. No. 269,577
Int. Cl. B65d *33/24*
U.S. Cl. 229—62 **9 Claims**

A device for opening and re-sealing a flexible container includes an anchor or base portion attached to the main body of the bag, a tear-away part attached to a section of the bag desired to be torn away when the tear-away part is separated from the base portion of the device along a predetermined shear line, and a locking or clipping appendage attached to the base portion along a first fold line. The base portion is provided with a second fold line. The bag is opened by tearing the tear-away part of the device to remove it together with a portion of the bag to form a dispensing aperture. Re-sealing is effected by folding the base portion along the second fold line, releasably engaging the folded section of the base portion with

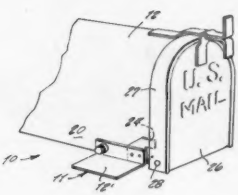


the remaining section, and then folding the appendage over the folded section of the base portion and clipping it to hold the doubled-over base portion in a locked or reclosed position.

3,815,811
SENTINEL MAIL SIGNAL

F. L. Harmon, 1612 Lincolnton Rd., Salisbury, N.C. 28144

Filed Jan. 16, 1973, Ser. No. 324,211
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **1 Claim**



A signal device secured to a rural mail box so to notify a rural resident whether a mailman has stopped at the mailbox, thus eliminating the resident walking to the mailbox before the mailman arrives, the device consisting of a downwardly pivotable flag that is attached to a hook insertable between the mailbox and the mailbox front door so that when the door is opened, the hook slips out so that the flag is downwardly pulled by gravity into a position where it can be clearly seen from the house.

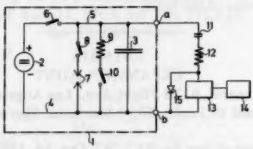
3,815,812
METHODS AND MEANS FOR COUNTING WELDING OPERATIONS

Dankmar Tauern, House Nr. 390, 9497 Triesenberg, Liechtenstein

Filed June 11, 1973, Ser. No. 368,484
Claims priority, application Germany, June 23, 1972, 2230915
Int. Cl. H03k *25/00;* **B23k** *9/00*
U.S. Cl. 235—92 PD **29 Claims**

In the apparatus disclosed a welder produces welds by discharging a capacitor bank through a stud to be welded. Sensing means reactively coupled to the circuit produces signals corresponding to the changes in an electrical condition at the capacitor bank. Threshold means responsive to the sensing means produce an indication when the signal traverses a predetermined magnitude lower than that corresponding to

a welding discharge of the capacitor but higher than signals expected from other changes to be expected in the electrical



condition. A counter counts the number of indications. Preferably suitable diodes with sensing means suppress signals due to changes in charging currents in the capacitor bank.

3,815,813

HOT WATER HEATING SYSTEM

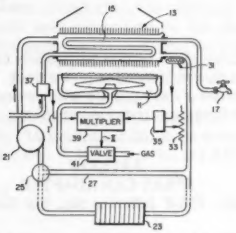
Jean-Claude Charron, Saint-Maur, and Francois Sagnard, Paris, both of France, assignors to Duval Saunier, Paris, France

Filed May 26, 1972, Ser. No. 257,157

Claims priority, application France, May 26, 1971, 71.18994

Int. Cl. F24d *3/02, 17/00*

U.S. Cl. 236—23 **4 Claims**



In the hot water heating system disclosed herein, a sensing means such as a thermistor provides a first electrical control signal which represents deviation of outlet water temperature from preselected value and a flowmeter provides a pulsating electrical signal having a frequency which varies as a function of rate of flow through the heating system. An output signal is generated having a frequency equal to that of the pulsating signal and a squarewave pulse duration which varies as a function of the first control signal. Heater means are then energized by the output signal so as to provide a thermal input to the heating system which is substantially proportional to the product of water output temperature deviation and flow rate. This control minimizes output temperature fluctuations due to thermal inertia and heater lag.

3,815,814

ATOMIZER INTERRUPTER

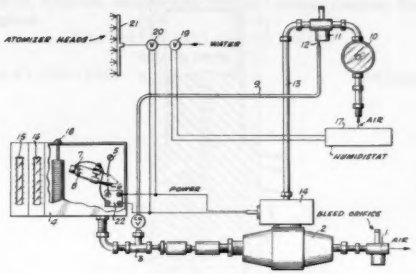
Jack Ashley Burgess, Greenville, S.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 213,396, Dec. 29, 1971, abandoned. This application June 22, 1973, Ser. No. 372,739

Int. Cl. G05d *22/02*

U.S. Cl. 236—44 R **2 Claims**

A timed atomizer interrupter in series with a humidistat control interrupter for humidity control of rooms and other spaces controls the periods during which water is sprayed to control humidity. The present invention deals primarily with the timed interrupter. Air from a conventional humidistat passes through an electropneumatic valve to a pressure control device of conventional design. The flow of air is through a restriction which determines the time during which air pressure builds up in the pressure switch. When the switch closes, the electro-pneumatic valve disconnects air from the humidistat and permits it to escape slowly through an adjustable bleed orifice until the pressure has dropped to the point where the pressure control switch opens. The rate of bleed from the pressure control switch determines the time before pressure



drops to the point where the control switch opens. Preferably a check valve is interposed in the connections from the electropneumatic valve to the pressure control device and is provided with a bypass conduit to the bleed orifice. This further lengthens the off period and shortens the on period of the pressure control device. It also smooths the operation.

3,815,815

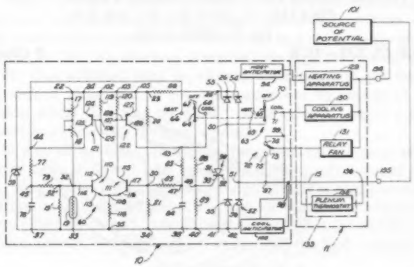
SOLID STATE THERMOSTAT

Said Sapir, Westlake Village, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,740

Int. Cl. G05d *23/30*

U.S. Cl. 236—78 **9 Claims**

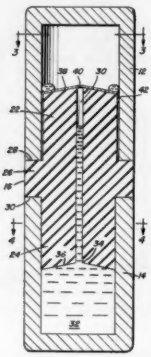


Electrical thermostats which require the running of only a minimum number of lead wires for a maximum number of functions. In one case, a capacitor smooths the firing potential of a unijunction to prevent rapid cycling, undue noise and wear. In another case, a differential amplifier with capacitor smoothed positive feedback prevents unwanted fast cycling. In both cases, the unijunction and the differential amplifier receive inputs from a thermistor bridge and control the passage of current through a full-wave diode bridge via a silicon-controlled rectifier.

3,815,816
CONDITION RESPONSIVE SWITCH DEVICE

David F. Scarelli, 214½ E. Spruce St., East Rochester, N.Y. 14445

Filed Jan. 3, 1973, Ser. No. 320,814
Int. Cl. H01h 37/36
U.S. Cl. 337—331 16 Claims

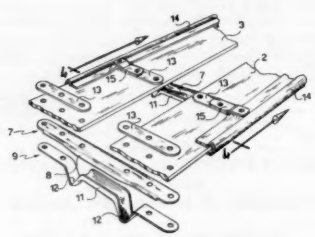


A condition responsive switch device comprising a member with a liquid passageway therein, a reservoir of conductive liquid, such as mercury, at one end of the passageway defining a movable contact, a stationary contact at the opposite end of the passageway normally spaced from the conductive liquid but contacted thereby under predetermined conditions. Preferably, an expansion chamber is provided above the passageway permitting uninhibited movement of the conductive liquid toward the stationary contact. In addition, a solid conductor may be provided in the passageway to reduce the volume of the conductive liquid and increase the current carrying capacity of the device.

3,815,817
TUNDRA TRACK FOR A TRACKED VEHICLE

Michael A. T. Bamford, Calgary, Alberta, Canada, assignor to Flextrac Nodwell Ltd., Calgary, Alberta, Canada

Filed May 11, 1973, Ser. No. 359,520
Int. Cl. E01b 23/00
U.S. Cl. 238—10 R 9 Claims

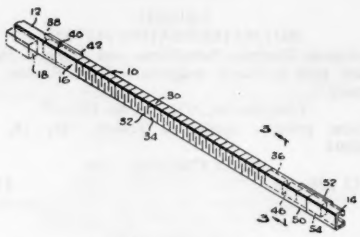


A track particularly adapted for use on the tundra and arranged to avoid shearing the top and shallow layer of vegetation thereof; said track including a pair of endless belts, load distributing members replacing the conventional grouser bars on the outer side of the belts and secured on the inner side of the latter to maintain the conventional and required rigidity of the load transmitting members while allowing only shallow projections from the outer side of the belts such that the latter will bear the vehicle on soft ground while producing only shallow and non-destructive impressions into the latter, particularly on the tundra. On hard ground, shallow plates and or bolt heads against the outer side of the belts engage the ground and minimize wear of the belts.

3,815,818
EXPANSION JOINT

Lester G. Janzow, 6128 Flight Ave., Los Angeles, Calif. 90056, and Ronald D. Lipke, 5037 Muriotta, Sherman Oaks, Calif. 91403

Division of Ser. No. 767,297, Oct. 14, 1968, Pat. No. 3,637,957. This application Oct. 12, 1971, Ser. No. 188,500
Int. Cl. E01b 11/02
U.S. Cl. 238—228 1 Claim

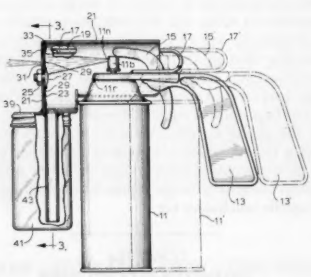


An expandable track section particularly useful for joining sections of an electrical signal or power track. The expandable section comprises a track portion with numerous lateral slots on either side forming a zig-zag member.

3,815,819
SPRAY CAN ADAPTER

Robert Hamlin, 938-F Jefferson Sq., Elk Grove Village, Ill. 60007

Filed Aug. 24, 1973, Ser. No. 391,062
Int. Cl. B05b 11/00
U.S. Cl. 239—11 10 Claims

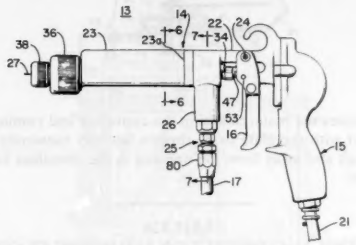


Method and apparatus for restricting the spray from an aerosol spray can to a limited area is disclosed. More particularly, a rotatable disc having a plurality of apertures therein is interposed between the aerosol spray can and the surface being sprayed in a plane substantially normal to the spray and rotated to selectively align one of the apertures with the spray. Accordingly, the cross-sectional characteristics of the spray applied to the surface conform to the corresponding characteristics of the selected aperture. The disc is also adjustably positionable to a selected distance from the aerosol spray can for controlling the intensity of the spray through the aperture. The present invention is especially well-suited for repairing defects in wood finishes.

3,815,820
HYDROSTATIC ATOMIZING APPARATUS

Richard O. Probst, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed Apr. 12, 1963, Ser. No. 272,615
Int. Cl. B05b *5/02*
U.S. Cl. 239—15 **29 Claims**

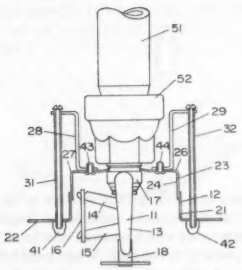


An apparatus for atomizing liquid coating material and electrostatically depositing the material on a surface to be coated comprising an elongated body of insulating material having two passages therethrough, one passage for liquid coating material and the other passage containing resistor means connected with a source of high electrical potential. An electrode is connected with said resistor means for electrostatically charging atomized particles of said coating material.

3,815,821
ADJUSTABLE ESCUTSCHEON

Paul V. Metcalfe, 315 Southwood Rd., Palm Beach, Fla. 33480

Filed Dec. 4, 1972, Ser. No. 311,827
Int. Cl. A62c *37/08*
U.S. Cl. 239—37 **5 Claims**

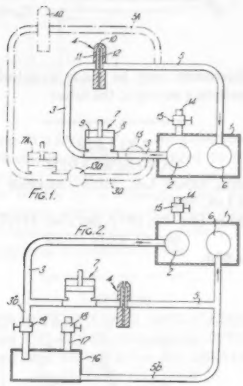


An escutcheon for supporting, protecting, and in part concealing a portion of the sprinkler head and other parts of a sprinkler system, for preventing or minimizing fire losses, in combination with means for adjusting the position of the escutcheon to various desired positions relative to said sprinkler system. The escutcheon comprises two annular collars, both of which are L-shaped in cross section. Each of the collars has a portion which has a vertical axis coinciding with the axis of the ring of the other collar, and one ring is arranged to be positioned within the other ring. Each of the collars has a horizontal flange which in both cases extends horizontally away from the other ring. Either or both of the collars may be turned over so that the vertically extending portion extends either up or down and thus at one time the outer collar may have its vertically extending portion extending up and the inner ring have Its vertically extending portion extending down, or both of the inner and outer rings may have their vertically extending portions extending up, or both may have such portions extending down, or the outer ring may have its vertically extending portion extending down and the inner ring have its vertically extending portion extending up. Means are provided for adjusting the collars relative to each other.

3,815,822
ADHESIVE-APPLYING APPARATUS

Robert William Davies, and Leonard Thornton, both of Deptford, England, assignors to Molins Limited, London, England

Filed Nov. 20, 1972, Ser. No. 308,097
Int. Cl. B05b *1/32*
U.S. Cl. 239—125 **19 Claims**



A flowable adhesive is applied to a carton blank or paper web by an application nozzle, having a discharge orifice, which is permanently open to ambient pressure. The nozzle is divided into two compartments which are interconnected adjacent to the orifice. One compartment is connected to an adhesive container by a feed conduit and the other is connected to the container by a return conduit.

Adhesive is continuously fed by a pump, at a predetermined pressure higher than ambient pressure from the container to the nozzle and returned to the container by a separate suction pump, so that no adhesive is ejected through the orifice. In order that adhesive may be ejected the pressue in the feed conduit is increased, at the required times by means of a piston which displaces adhesive from a cylinder which is in communication with the feed conduit.

In a modified form the nozzle comprises coaxial inner and outer tubes the inner tube being adjustable axially relative to the outer tube. By suitably adjusting the two pumps and the difference in level between the ends of the tubes, adhesive may either be caused to flow continuously from the nozzle or intermittently, by increasing the pressure in the feed conduit.

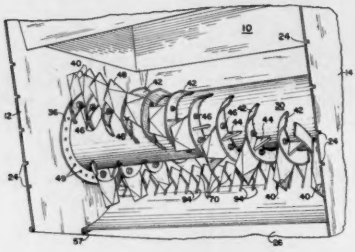
3,815,823
STRAW CHOPPER ATTACHMENT FOR HARVESTER COMBINES

Orlin W. Johnson, East Moline, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 27, 1973, Ser. No. 336,392
Int. Cl. A01f *29/00*; **A01c** *15/00*
U.S. Cl. 239—650 **10 Claims**

A straw chopper attachment of the type in which a deflector plate directs the straw toward and against a chopper blade rotor disposed within a hood and in which chopper blade wear may be compensated for by shifting the deflector plate toward the rotor to preserve a predetermined optimumm blade-to-

plate clearance gap. The plate is pivoted within the hood for swinging movement toward and away from the rotor and the

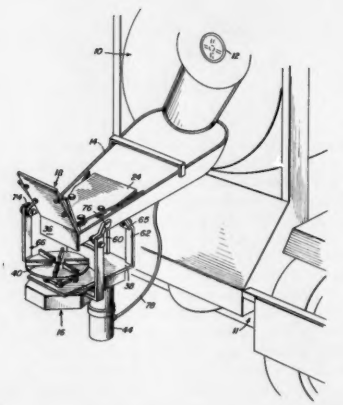


necessary adjustments may be made exteriorly of the hood without necessitating access to the latter.

3,815,824
SAND SPREADER

Roger E. Olson, Albert Lea, Minn., assignor to Emil Olson, Inc., Albert Lea, Minn.

Filed Dec. 29, 1972, Ser. No. 319,737
Int. Cl. E01c *19/20*
U.S. Cl. 239—674 **7 Claims**



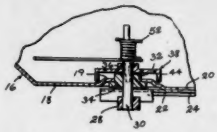
A sand spreader having a spreader assembly mounted on a discharge end portion of the chute of a ready-mix, or mixer-body, truck, and the like. A hopper assembly is arrangeable in the discharge end portion of the chute for controlling a fluent material flow from the chute to the spreader assembly.

3,815,825
BEARING PROTECTOR FOR FLUENT MATERIAL DISTRIBUTORS

Paul Lee Bowerman, Silver Lake, Ind., assignor to The Cyclone Seeder Company, Inc., Urbana, Ind.

Filed May 1, 1972, Ser. No. 249,388
Int. Cl. A01c *17/00;* **F16c** *33/74*
U.S. Cl. 239—683 **2 Claims**

A protector for use in conjunction with a distributor for seed, plant and other fluent type material. The distributor includes a container for the fluent material and has a bottom portion having an opening therein. A shaft is connected to a rotatable material impeller and protrudes upwardly through the opening in the container bottom portion where the protector which is plate shaped is connected to the shaft adjacently above the opening. The plate rotates with the impeller shaft

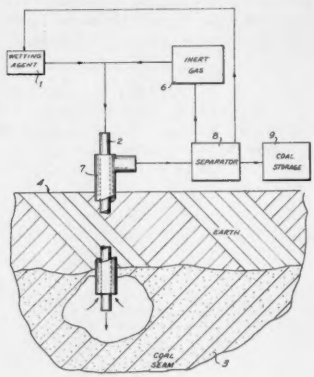


and causes the material within the container and coming into contact with the plate to be thrown laterally outwardly from the shaft and away from the opening in the container bottom portion.

3,815,826
CHEMICAL COMMINUTION AND MINING OF COAL

Robert G. Aldrich, Manlius; Douglas V. Keller, Jr., Lafayette, and Richard G. Sawyer, Syracuse, all of N.Y., assignors to Syracuse University Research Corporation, Syracuse, N.Y.

Filed Feb. 18, 1972, Ser. No. 232,324
Int. Cl. B02c *19/00*
U.S. Cl. 241—1 **3 Claims**



Coal, whether in a sub-surface stratum or in large lumps as mined by standard means is reduced to fragments by treatment with compounds which weaken interlayer forces at natural interfaces present in the coal. When coal below the earth's surface is treated with such compounds, the fragments can be suspended in inert gas moving at a sufficiently rapid rate and carried to the surface where the comminuted coal can be collected.

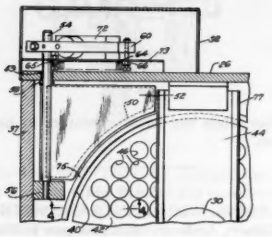
3,815,827
WASTE DISINTEGRATOR

Earl H. Bradley, Seekonk, Mass., assignor to General Signal Corporation, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,056
Int. Cl. B02c *18/40*
U.S. Cl. 241—46 R **7 Claims**

A waste disintegrator for comminuting solid particles in a fluid passing therethrough having a transverse wall in its housing, the transverse wall having a central opening through which the fluid is channeled and a comminuting means is mounted in that opening. A fluid bypass is formed in the transverse wall in a peripheral area thereof and covering this opening is a flapper valve that is pivotally secured to the

downstream side of the transverse wall. The flapper valve has one of its ends fixedly secured on a shaft that passes through a housing wall of the disintegrator and to this shaft at its end is attached an arm. A coil spring that has one of its ends secured to the housing and its other end secured to one end of the arm, provides a relatively constant spring tension on the arm and thus constantly urges the flapper door to remain in its closed position or to return to its closed position when the differential



pressure across the transverse wall diminishes to a predetermined level. Also mounted on the wall housing is a microswitch which is part of a warning signal circuit. The switch is in engagement with the arm when the flapper door is closed and it is under this condition that the switch is open. As increased differential pressure forces the flapper door open, the arm moves away from the switch closing the circuit which in turn activates the warning signal.

3,815,828

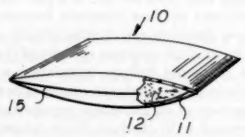
IMPERFORATE DISPENSER FOR DISPENSING VOLATILE MATTER AS GAS AND/OR VAPOR TO A SURROUNDING ATMOSPHERE AND METHOD FOR FORMING SAME

Walter H. Engel, Southport, Conn., assignor to Porosan Interests, U.S.A., Inc., Fairfield, Conn.

Filed July 28, 1972, Ser. No. 276,221

Int. Cl. A24f *25/00*; A61j *15/00*

U.S. Cl. 239—56 **11 Claims**



This disclosure is directed to an article for dispensing volatile matter as a gas and/or vapor in a chemically unchanged state to the surrounding atmosphere. This is attained by confining either an aqueous emulsion comprising a volatile matter formed with the help of a surfactant and/or pad impregnated or over-saturated with volatile matter in an hermetically sealed, liquid impervious envelope or container formed of a water insoluble vinyl polymer, co-polymer or derivative thereof. The internal walls of the envelope being disposed contiguous the aqueous emulsion or impregnated pad are readily wetted or influenced thereby to result in a gradual yielding of the volatile matter therein through the liquid impervious walls of the envelope as a gas or vapor in a chemically unchanged, dry state to the surrounding atmosphere. To enhance the release of the volatile contained in the aqueous emulsion through the walls of the envelope, the envelope is externally impregnated with an aqueous emulsion of a volatile material formed with the help of a surfactant or emulsifier.

3,815,829

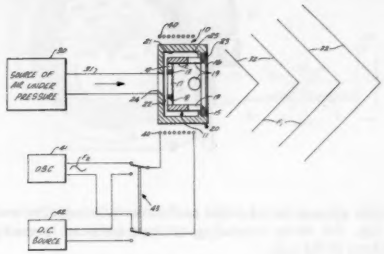
ELECTRICAL ENHANCEMENT OF PRESSURE WAVE ENERGY

Edson B. Gould, III, Newport Beach, Calif., assignor to Energy Sciences Incorporated, El Segundo, Calif.

Filed Jan. 24, 1973, Ser. No. 326,408

Int. Cl. B05b *3/14*

U.S. Cl. 239—102 **25 Claims**



Pressure waves at a frequency F_1 are generated in a stream of fluid and electrical energy is coupled to the stream to enhance the pressure waves. The electrical energy may be coupled to the stream by a magnetic field parallel to the stream. The electrical energy may be direct current or alternating current having a frequency F_2, where F_1 and F_2 are preferably multiples of a common divisor.

3,815,830

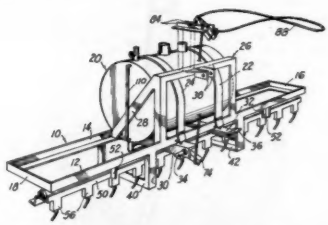
LIQUID FERTILIZER APPLICATOR

Robert A. Rowan, P.O. Box 68, Enigma, Ga. 31749

Filed Sept. 18, 1972, Ser. No. 290,119

Int. Cl. B05b *1/16, 1/20*

U.S. Cl. 239—163 **7 Claims**



Uniform distribution of liquid fertilizer from an applicator carried behind a tractor or other vehicle is achieved by arranging on air bleed pipe in the liquid fertilizer supply tank. After filling, the tank is closed except for the air bleed pipe so that during operation the bottom end of the air bleed pipe maintains a substantially uniform head at the nozzle orifices of a horizontally arranged spray boom. Easily replaceable jets are used to control the orifice size and the nozzles are connected to the horizontal spray boom through short lengths of flexible tubing. A selective shut-off control is achieved by flattening the tubing lengths through an over center linkage mechanism.

3,815,831

IRRIGATION SPRINKLERS

Abraham S. Jooste, 13 Exmouth Rd., Cape Town, South Africa

Filed Mar. 22, 1973, Ser. No. 343,663

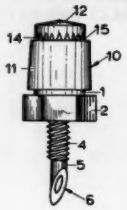
Claims priority, application South Africa, Apr. 19, 1972, 72/2648

Int. Cl. B05b *1/14*

U.S. Cl. 239—498 **11 Claims**

A sprinkler comprising a body, a passage having an inlet and an outlet end through the body, means associated with the

inlet end for connecting it to a supply source of water and a distribution cap located over the outlet end, the cap having a skirt extending away from the body, a closed end remote from



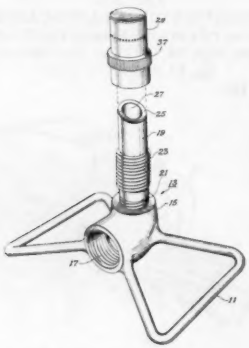
the body and a series of outlet perforations through the wall of the cap, the series extending at least partway around the periphery of the cap.

3,815,832

SPRINKLER APPARATUS

Malcolm O. Floyd, Fort Worth, Tex., assignor to Robert A. Folsman, Fort Worth, Tex., a part interest

Filed Jan. 5, 1973, Ser. No. 321,346
Int. Cl. A62c *37/20*
U.S. Cl. 239—563 10 Claims



Sprinkler apparatus is disclosed for distributing fluid in a spray pattern in a complete circle, or any selected segment thereof through utilization of an upright conduit and a movable cap means such that a circumferential row of apertures may be progressively covered or uncovered by movement of the cap means.

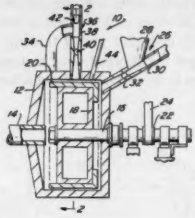
3,815,833

METHOD AND APPARATUS FOR GRINDING THERMOPLASTIC MATERIAL

Edward Van Vliet, Doylestown, and William R. Dostmann, Perkasie, both of Pa., assignors to Fluid Energy Processing & Equipment Company, Hatfield, Pa.

Filed Jan. 8, 1973, Ser. No. 321,958
Int. Cl. B02c *19/06*
U.S. Cl. 241—5 7 Claims

A method and apparatus for grinding thermoplastic material utilizing a jet and anvil type mill where the particular material to be ground is injected into a chamber against a rotating anvil means while also injecting a liquid into the chamber, the liquid evaporating to cool and embrittle the particles, and then accelerating and re-injecting the particles into



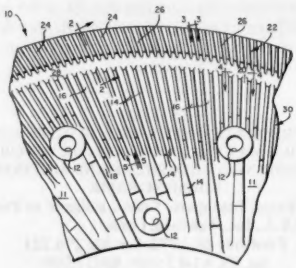
the chamber while the liquid continues to be injected for evaporation.

3,815,834

NOVEL DISC REFINER AND METHOD

Henry S. Gilbert, Andover, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.

Filed Feb. 12, 1973, Ser. No. 331,521
Int. Cl. B27l *11/08*
U.S. Cl. 241—28 11 Claims



Novel refining disc plate for use in a disc refiner, the plate being characterized by flow channels between the refining bars which flow channels are of substantially constant cross section, thereby to allow constant velocity of fluid through the channels and markedly reduce turbulence within the disc refiner. The diminished turbulence results in better power efficiency, a reduction in maintenance requirements and an improved defiberized pulp product. Most advantageous plates formed according to the invention include a peripheral flow-retarding ring having a number of flow-dividing ribs and flow paths between the ribs, which flow paths are offset at a small angle from the aforesaid channels.

3,815,835

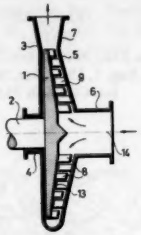
DISAGGREGATION APPARATUS FOR PRODUCING FINE DISPERSIONS

Tamas Apostol; Janos Barna; Alajos Egri; Zsigmond Kaplar, and Tibor Majtenyi, all of Budapest, Hungary, assignors to Banyaszati Kutato Intezet, Budapest, Hungary

Filed Apr. 18, 1972, Ser. No. 245,162
Int. Cl. B02c *7/04*
U.S. Cl. 241—188 A 1 Claim

Disaggregation apparatus for producing fine dispersions comprises a rotary disc and a stator disc having circular rings of teeth protruding into each other and arranged side-by-side with the rings of stator teeth disposed in alternate relation with the rings of rotor teeth, all the rings of teeth being concentric with each other. The space between the teeth comprises apertures identical in number and width for each tooth ring. The

apertures both in the stator disc and in the rotor disc are rearwardly inclined relative to the direction of rotation, the differences between the angle included between the center line



of the apertures of the stator and rotor discs and the radii from the axis of rotation decreasing in a radially outward direction. In other words, the apertures are progressively less rearwardly inclined in a radially outward direction.

3,815,836

SLEEVE CHUCK FOR THREAD WINDING DEVICE

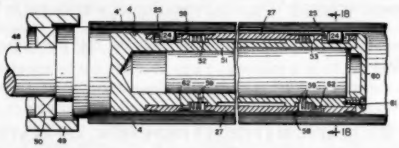
Gerd Munnekehoff, and Hansjochen Busch, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Feb. 8, 1972, Ser. No. 224,507

Claims priority, application Germany, Feb. 11, 1971, 2106493; Feb. 17, 1972, 2202009

Int. Cl. B65h *54/54*

U.S. Cl. 242—46.4 **7 Claims**



A sleeve chuck in a textile winding device in which the winding shaft, adapted to hold or grip a bobbin or core sleeve, is made up of an inner shaft means freely rotatable within an outer cage means provided with openings to receive individual gripping elements in cammed engagement with the shaft means and also including spring means interconnecting the shaft and cage means to resiliently urge the gripping elements radially outwardly of the cage means.

3,815,837

METHOD AND APPARATUS FOR CONTROLLING PAY-OFF OF WIRE FROM A COIL TO A WIRE PROCESSING MACHINE

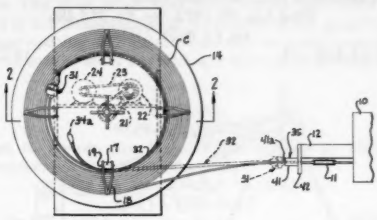
Robert M. Guthrie, Rockford, Ill., assignor to Fastener Engineers, Inc., Rockford, Ill.

Filed Mar. 19, 1973, Ser. No. 342,538

Int. Cl. B65h *75/28*

U.S. Cl. 242—54 R **4 Claims**

A method and apparatus for controlling pay-off of wire from a coil to a wire processing machine having a wire feed mechanism for withdrawing the wire from the coil in which the coil is supported on a rotatable pay-off reel. A releasable wire gripper is attached to the tail end of the coil on the reel and the gripper is anchored to the pay-off reel by an elongated flexible connector wound around the coil and having a length sufficient to extend from the reel to the processing machine. A brake mechanism is provided for controlling rotation of the reel and to control tension in the wire as it unwinds from the reel and to maintain tension on the flexible connector as the



tail end of the coil exits from the reel to thereby restrain whipping of the tail end of the wire.

3,815,838

Patent Not Issued For This Number

3,815,839

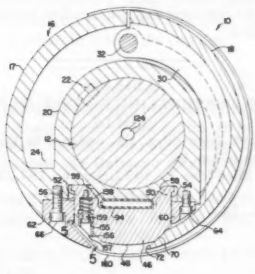
EXPANSIBLE WINDING DRUM ASSEMBLY

John F. Madachy, Mayfield Heights, Ohio, assignor to Loopco Industries, Inc., Cleveland, Ohio

Filed Apr. 2, 1971, Ser. No. 130,645

Int. Cl. B65h *75/24, 75/28*

U.S. Cl. 242—72 **11 Claims**



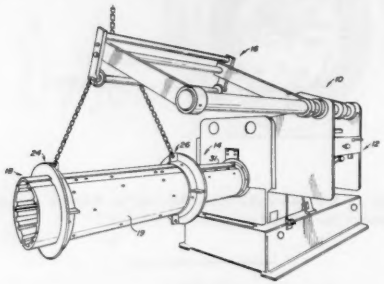
The specification and drawings disclose an expansible drum assembly particularly suited for use in rewinding metal strip. The disclosed device comprises a rotatably mounted center shaft having arcuate outer shells or segments carried thereon. The segments define the drum assembly's winding surface and each has a circumferential extent of less than 180°. One of the shells is pivotally connected to the shaft for arcuate movement in a generally radial direction. An actuating member extends longitudinally of the shaft between the shells. The actuating member has a surface which defines a continuation of the winding surface between the shells. Also, one surface on the actuating member is arranged to cam the pivotally mounted shell. Power means are provided for reciprocating the actuating member and radially. In the preferred embodiment, the power means comprise an expansible drum positioned between the actuating member and the shaft. Also disclosed is a strip clamp arrangement wherein the strip is clamped during outward movement of the actuating member.

3,815,840

EXPANSIBLE MANDREL ASSEMBLY AND METHOD

Robert F. Horton, Middleburgh Heights, and John F. Madachy, Mayfield Heights, both of Ohio, assignors to Loopco Industries, Inc., Twinsburg, Ohio

Filed Aug. 29, 1972, Ser. No. 284,486
Int. Cl. B65h 75/24
U.S. Cl. 242—72 10 Claims



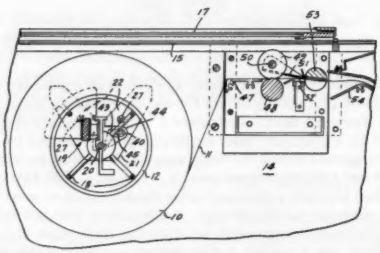
The specification and drawings disclose a method and apparatus for increasing the maximum effective outer diameter of an expansible mandrel or drum of the type having a plurality of radially movable segments. The method generally includes the use of a cylindrical assembly of arcuate segment members having an open inner diameter adapted to be telescopingly slidably received on the mandrel. The segment members are positively interconnected to each other by connecting means releasable exteriorily of the assembly. To use the assembly, it is slid unto a mandrel and each segment member positively connected to a separate segment of the mandrel. Thereafter, the means interconnecting the segment members are released and normal expansion of the mandrel can take place. Merely by reversing the procedure the assembly can be removed and the mandrel returned to its normal dimensions.

3,815,841

MEANS FOR CONTROLLING FEEDING OF PAPER FROM ROLLS

David F. Wolff, Glen Ellyn, Ill., assignor to Yorktown Industries Inc., Addison, Ill.

Filed May 26, 1972, Ser. No. 257,219
Int. Cl. B65h 23/06
U.S. Cl. 242—75.4 12 Claims



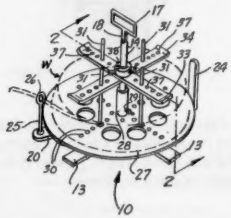
Feeding of paper web from rolls is controlled by adjusting drag bearings for roll spindle journals to effect balanced drag on rotation of the journals in the bearings, thereby enabling feeding of the paper by means of simplified feed roller arrangement wherein a single narrow frictional feed roller is centered on the web and the web automatically maintains centered relation to the feeding path by reason of the balanced tension on the web. A novel adjustment screw controlled drag device is provided in a bearing bracket adapted to be constructed as a molded one piece plastic part.

3,815,842

REEL

Willard D. Scrogin, 2121 Archer Ave., Live Oak, Calif. 95953

Filed Aug. 1, 1972, Ser. No. 277,093
Int. Cl. B65h 75/40
U.S. Cl. 242—96 5 Claims



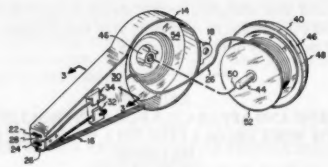
A reel for unreeling a coil of wire such as electricians wire which includes a guide, a support disk rotatably mounted on a central shaft and supported on a plurality of rollers positioned adjacent the peripheral edge thereof. A set-screw brake is threaded into the hub of the support plate and engages against the vertical shaft to provide a braking action to prevent the reel from unwinding too fast. A plurality of posts are adjustably positioned on the reel base and supported thereabove to support the inner circular portion of a coil of wire to be unwound therefrom. The wire passes through a guide eye to help in maintaining the alignment thereof. A handle is secured to the upper end of the shaft for moving the reel from place to place.

3,815,843

SOLDERING MATERIALS DISPENSING APPARATUS

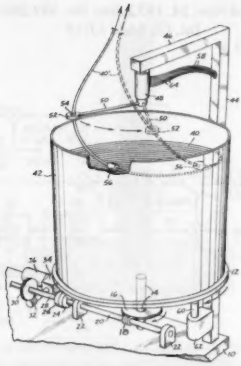
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed Jan. 2, 1973, Ser. No. 319,990
Int. Cl. B65h 75/40, 49/18
U.S. Cl. 242—96 4 Claims



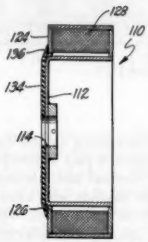
A molded, hand held dispenser for solder or other strand materials. The apparatus carries a plurality of replaceable, bobbin spools in a bobbin case body portion. A dispensing extension formed integrally therewith is provided with internal, strand guide means for dispensing the soldering materials through a snout portion of the extension. A molded cover plate for the dispensing extension portion is provided and includes retaining clip means for securing the ends of the strand materials when not in use. Similarly, a molded cover for the bobbin case portion is provided having an integral spindle for the bobbin spools.

3,815,844
METHOD AND APPARATUS FOR UNWINDING COILED MATERIAL
Leslie I. Wright, Portland, Oreg., and Jim W. Fitzgerald, Vancouver, Wash., assignors to Portland Chain Manufacturing Co., Division of Webster Mfg., Inc., Portland, Oreg.
Filed Mar. 20, 1972, Ser. No. 236,312
Int. Cl. B65h *49/00*
U.S. Cl. 242—128 4 Claims



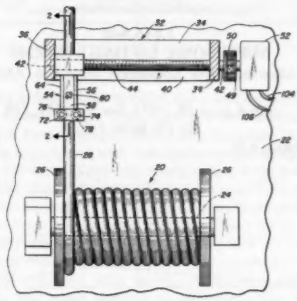
A rotatable platform is arranged to support a coil of material from which the material is to be fed in a direction substantially parallel to the axis of the coil. The outfeed end of the coil of material is received freely upward through a guide opening in the arcuately reciprocative arm of a control switch mounted above the platform. In a first position of the arm the switch is operated to effect rotation of the platform through an arc in the direction of the winding of the coil of material, whereby the outfeed end of the latter moves the arm to a second position in which the control switch is operated to effect stopping of rotation of the platform and to energize a platform brake. As the material continues to be fed from the coil it causes the arm to return to the first position, once again to effect rotation of the platform. Ths stepwise rotation of the platform during upward outfeeding and consequent unwinding of the coil of material prevents twisting and kinking of the outfeeding material.

3,815,845
CENTER UNWINDING SPOOL
Henry V. Rygiol, 164376 Janine Dr., Whittier, Calif. 90603
Filed Mar. 13, 1972, Ser. No. 234,221
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 2 Claims



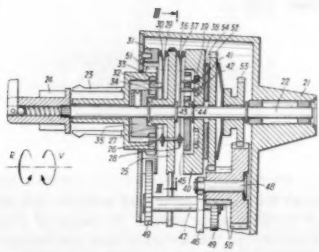
A center unwinding spool intended to be utilized with wire, but being capable of being utilized with other materials, is constructed so as to have an internal annular groove containing a cylindrical winding located about a centrally located hub. A space is provided interiorly with the winding and a guide means for guiding the strand of material from the interior of the winding is used in such a manner that at least a part of the guide means is in communication with the annular space. This guide means may be an interior wall within the spool in communication with the exterior of the spool by an annular opening. This guide means may be a tube extending into the annular space and leading to the exterior of the spool.

3,815,846
SELF-LEVEL WIND
Frank N. Biewer, San Diego, Calif., assignor to Offshore Technology Corp., Escondido, Calif.
Filed Jan. 10, 1973, Ser. No. 322,515
Int. Cl. B65h *54/28*
U.S. Cl. 242—158 R 9 Claims



A self-level wind for a line that employs a shiftable carriage, the carriage including rollers for guiding the line toward sensing mechanism. The sensing mechanism follows the shifting of the rollers as the line is being wound upon a spool. The sensing mechanism controls strain-responsive means, which means control a motor that shifts the carriage.

3,815,847
RECORDING OR REPRODUCING APPARATUS
Josef Morell; Johann Nowak; Josef Schild, all of Vienna, and Harald Wessner, Neunkirchen, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria
Filed Dec. 13, 1972, Ser. No. 314,676
Claims priority, application Austria, Dec. 15, 1971, 10745/71
Int. Cl. B65h *59/38*; G03b *1/02*; G11b *15/13*
U.S. Cl. 242—191 9 Claims



A strip handling apparatus which comprises a drive, a device for receiving a supply reel having a coil of strip and a device for receiving a take-up reel for the strip. The device for

receiving a take-up reel is coupled to the drive, whereas the device for receiving a supply reel is freewheeling and receives torque only by means of the strip. A detecting device is operatively connected with the device for receiving a supply reel and the device for receiving a take-up reel to find out the faster rotating one. The detecting device has a first and second position, in the first position of the detecting device the speed of the freewheeling device for receiving a supply reel is larger than the speed of the device for receiving a take-up reel, in the second position of the detecting device the speed of the device for receiving a take-up reel being larger than the speed of the freewheeling device. A torque reducing device is provided at least for the device for receiving a supply reel and having an operative and an inoperative position. The torque reducing device is controlled by the detecting device in the first position of the detecting device the torque reducing means being in the operative position, in the second position of the detecting means the torque reducing device being in the inoperative position.

3,815,848

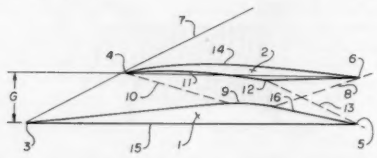
SUPERSONIC LIFTING SYSTEMS

Morton Alperin, 6000 Lockhurst Dr., Los Angeles, Calif. 91364

Filed June 28, 1972, Ser. No. 267,210

Int. Cl. B63c *3/06*

U.S. Cl. 244—1 N **2 Claims**



The present invention relates to a method and apparatus for reducing the drag, and thereby increasing the ratio of lift/drag of supersonic wings above that achievable with conventional swept wings. The invention is characterized by the fact that the drag reduction is achieved as a result of a mutual interaction among multiple lifting surfaces in a manner which results in lower drag than is achieved by a single lifting surface at the same lift.

3,815,849

APPARATUS FOR SUPPORTING A LOAD

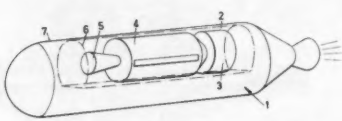
Spencer Davidson Meston, Saltford, England, assignor to British Aircraft Corporation Limited, London, England

Filed June 14, 1973, Ser. No. 369,882

Claims priority, application Great Britain, June 22, 1972, 29345/72

Int. Cl. B64g *1/10*

U.S. Cl. 244—1 SS **9 Claims**



A support for supporting a load within a structure e.g. a space tub within a space shuttle, by means of a number of pairs of fluid devices, the devices of each pair being positioned at diametrically opposite sides of the load, and being interconnected by fluid interconnection means so as to resist relative similar movements between opposite sides of the load and the structure in a predetermined direction and in a predetermined plane but to allow limited differential movements between said opposite sides of the load and the structure in said predetermined direction in said predetermined plane.

3,815,850

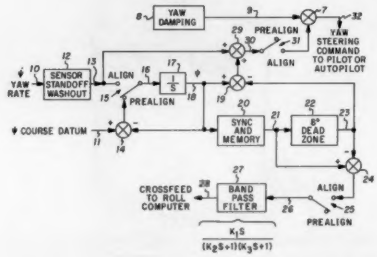
CRAB ANGLE REFERENCE SIGNAL DEVELOPMENT FOR LIMITED FORWARD SLIP LANDING MANEUVER

Robert F. Tribuno, Santa Monica, Calif., and Jimmie L. Foster, Marion, Iowa, assignors to Collins Radio Company, Dallas, Tex.

Filed Nov. 24, 1972, Ser. No. 309,308

Int. Cl. B63c *13/18*

U.S. Cl. 244—77 A **7 Claims**



A signal processing apparatus for developing a yaw command signal as might be advantageously employed in effecting decrab prior to touchdown. The signal is formulated from utlizing course datum prior to decrab to reference an integrator to which yaw rate is applied during decrab. A limiter processes the yaw command signal to establish a maximum permissible decrab maneuver.

3,815,851

MOLD FOR CASTING TEST SAMPLES

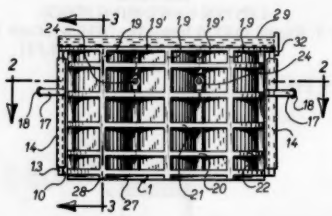
Rheal Girard, 3460A Chemin Ste-Foy, Quebec, Province of Quebec, Canada

Filed July 24, 1972, Ser. No. 274,194

Claims priority, application Canada, Aug. 13, 1971, 120563

Int. Cl. B28b *7/24*

U.S. Cl. 249—121 **7 Claims**

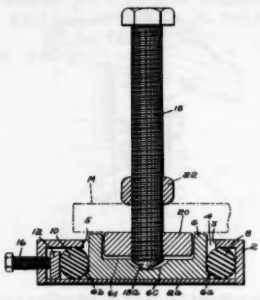


A re-usable mold for casting cylindrical concrete test samples. The mold is made of a pair of complementary mold sections which abut at vertical and horizontal edges to define three cylindrical mold cavities with each cavity sealed at the bottom and sealed from each other. The mold sections are retained together by tapered channels carrying handles for the transport of the mold. The mold has a box-like outer shape so that the mold can be shipped by trucks or the like transport without requiring packaging, as is now necessary for test molds of cylindrical outer shape.

3,815,852
MACHINE MOUNT APPARATUS AND METHOD FOR LIMITING MOTION OF A HEAVY MACHINE

Richard W. May, 5 Leeland Tr., Lexington, Mass. 02173

Filed Oct. 13, 1972, Ser. No. 297,336
Int. Cl. F16f 15/00
U.S. Cl. 248—24 4 Claims

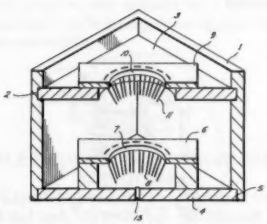


Motion of a heavy machine in space, as exemplified by a reciprocating screw injection molding machine in which internal shock forces are induced in the normal operating cycle of the machine while supported on a floor, is contained by machine-supporting members in which special motion-limiting means are provided. Limiting motion of the machine in space is accomplished by restraining forces representing reaction caused by resistance to horizontal displacement of a combination of motion-limiting components.

3,815,853
PLANTER BOX AND STEM HOLDER

Elvin J. Bahner, Weimar, Tex. 78962

Filed Oct. 10, 1972, Ser. No. 296,117
Int. Cl. F16m 13/00
U.S. Cl. 248—44 2 Claims

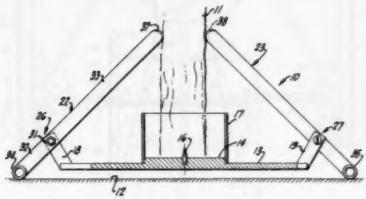


A planter box and stem holder for artificial plants having a container formed in the desired shape in which is mounted on the inside bottom thereof a platform having an axial orifice around the periphery of which a series of wire members are angularly mounted, with the lower ends of the wire members extending downwardly and inwardly to form a conical stem receiving area and an upper partition mounted in said container, in which an axial orifice is formed and on which a platform is formed having an axial orifice and a series of wire members angularly mounted around the periphery of said last mentioned orifice.

3,815,854
TREE STAND

Albert E. Zipser, 2007 Faith Home Rd., Modesto, Calif. 95351

Filed Mar. 12, 1973, Ser. No. 340,314
Int. Cl. A47g 33/12
U.S. Cl. 248—47 1 Claim

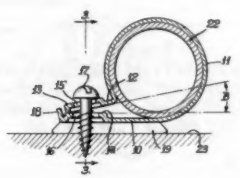


A stand for holding trees upright, the stand including a base plate with scissor action legs arranged to facilitate rapid mounting and dismounting of the tree on the stand. A triangular base plate is provided with a sharpened point adapted to be impaled on the base of the tree trunk, and a bowl is mounted concentrically about the point to hold a reservoir of water. The legs are pivotally mounted to brackets extending upwardly from each apex of the triangular base plate. The leg lower portions are provided with stabilizing feet which contact the underlying floor surface, and the leg upper portions are provided with rounded ends having concaval recesses conforming with the outer surface of the tree trunk. Reaction forces acting on the leg lower portions from the weight of the tree pivot the leg upper portions inwardly into secure engagement with the trunk, with the legs then locked in position by the tightening of self-locking nuts.

3,815,855
INTEGRAL CLAMP AND CLAMP-BACK FOR ELECTRICAL CONDUIT

Arthur I. Appleton, 1 Bridlewood Rd., Northbrook, Ill. 60062

Filed Aug. 10, 1972, Ser. No. 279,341
Int. Cl. F16l 3/12
U.S. Cl. 248—74 B 3 Claims



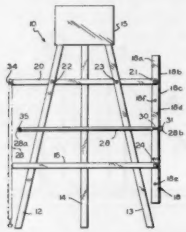
The integral clamp and clamp-back are stamped from a single piece of sheet metal. Two space support runners extend in one direction from a base. From one end of the base a hand extends outwardly from between the runners. At the distal end of the band is a clamp plate. The clamp plate is positioned above the other end of the base and each has an opening therethrough which a mounting fastener can extend. The length of the band is somewhat smaller than the external circumference of the conduit it is to hold.

3,815,856

HANDREST ATTACHMENT FOR ARTIST'S EASEL

Angelo J. Cortimilia, Rt. 1, Box 600, Rockaway, Oreg. 97136

Filed Nov. 15, 1972, Ser. No. 306,929
Int. Cl. A47g *1/24*; A47b *97/04*
U.S. Cl. 248—118 7 Claims



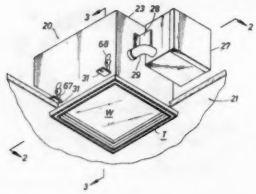
A handrest attachment for conventional leg-supported artist's easels includes a long notched upright support member offset at one side of the easel in the approximate plane of the easel's front legs for supporting one end of a maulstick. The support member is attached to the easel by a horizontal brace connected to the easel's front legs and by the easel's work support. The notched maulstick support has a series of notches along its length, each sized to receive only a reduced end portion of the maulstick. The loose connection between the maulstick and its support permits limited pivoting movement of the maulstick while restricting its axial movement while the opposite end of the maulstick is held in the artist's nonworking hand and while the working hand rests on the maulstick.

3,815,857

LIGHT FIXTURES

Ralph M. McFarlin, Pasadena, Tex., assignor to Esquire, Inc., New York, N.Y.

Division of Ser. No. 205,579, Dec. 7, 1971, Pat. No. 3,710,096, which is a division of Ser. No. 26,706, April 8, 1970, Pat. No. 3,652,847. This application Dec. 26, 1972, Ser. No. 318,023
Int. Cl. F16m *13/00*
U.S. Cl. 248—223 2 Claims



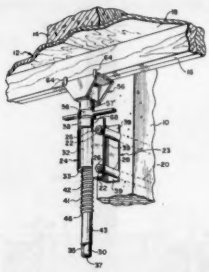
A light fixture having a housing which fits closely within the lower end of a recess in a ceiling, and a reflector which has a frame about its open lower end for fitting closely within the lower end of the recess. The frame is releasably attached to the housing when so fitted to permit it to be moved through the lower end thereof, whereby access may be had to the interior of the housing above the reflector from beneath the ceiling.

3,815,858

ROLL OUT FORMWORK SUPPORT

Richard C. Mocny, Prospect Heights, and Francis B. Mueller, Downers Grove, both of Ill., assignors to Waco Scaffold & Shoring Co., Division of Bliss & Laughlin Industries, Inc., Schiller Park, Ill.

Filed Jan. 12, 1973, Ser. No. 322,969
Int. Cl. A47f *5/10*; A47h *33/00*; E04g *17/16*
U.S. Cl. 248—295 10 Claims



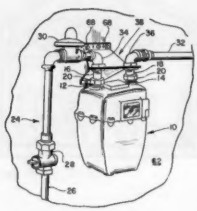
An adjustable support for shoring and rolling out formwork intact for reuse in pouring concrete slabs for successively higher floors in which a sleeve screw telescopes freely in a tubular support mounted on a structural column and is threadably supported by a non-rotatable nut resting loosely on the tube with a winged nut above it. The upper ends of the sleeve screw rotatively telescope with each other, one having a spindle received internally in the sleeve screw end and the other a collar received around the sleeve screw as adjustably supported by the winged nut to vary the relative heights of the roller and shoe. The sleeve screw is rotatable by a hand or power wrench from below the tubular support to adjust the roller and shoe vertically as a unit.

3,815,859

GAS METER SETTING OR THE LIKE

Wilbur R. Leopold, Jr., 29 Country Club Rd., Decatur, Ill. 62521, and John J. Smith, deceased, late of 69 Country Club Rd., Decatur, Ill. 62521 (by Beatrice A. Smith, executrix)

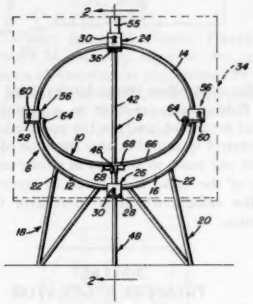
Division of Ser. No. 175,312, Aug. 26, 1971. This application Sept. 21, 1972, Ser. No. 291,028
Int. Cl. F16m *13/00*
U.S. Cl. 248—300 6 Claims



A fluid meter setting or installation for gas meters or the like, the setting permitting the fluid supply line to be connected to a service line of a dwelling or the like while rigidly supporting the meter against torsion. The setting includes a simplified sheet metal bracket capable of being attached to a wall or post, the bracket permitting the use of conventional elbows and straight meter swivel members for properly orienting or supporting the meter. The bracket which is made from identical parts may be assembled at the point of manufacture or may be shipped to the user in nested arrangement of the

parts and then assembled at the site, thus, reducing manufacturing and shipping costs. The setting and the bracket are so designed as to eliminate all possibility of gas theft.

3,815,860
SIGN HOLDER
Reuben N. Bompart, 305 N. Ewing St., Helena, Mont. 59601
Filed Sept. 20, 1972, Ser. No. 290,497
Int. Cl. A47b *97/04*
U.S. Cl. 248—464 **4 Claims**

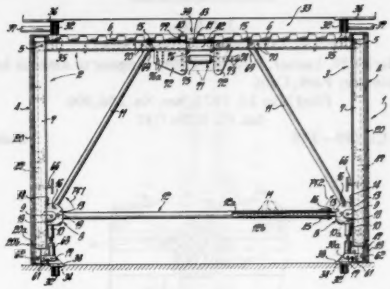


A portable easel-type holder or stand for signs, panels and the like characterized generally started by a leg-equipped main frame having means for detachably mounting a sign or panel thereon, a leg-equipped folding prop, and a complemental folding brace which stabilizes the prop when the holder is set up for use.

The main frame comprises a ring of desired diameter provided at circumferentially spaced points with brackets having headed detents for the sign. A lower half portion of the main frame is equipped with a pair of leg members cooperating with a third leg member constituting a prop and thus providing a tripodal stand. The prop is pivoted and folds against the main frame when collapsed for storage, shipping or handling. A complemental brace is also foldable to a compact position when not in use and can be swung down against a limit stop on the prop when erected for use.

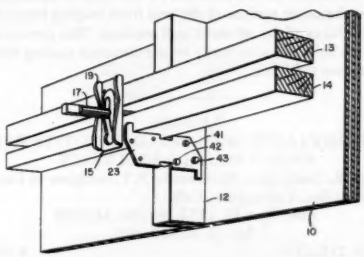
3,815,861
COLLAPSIBLE FORM FOR ERECTING OF MONOLITHIC STRUCTURES
Josef Maier, Kreuzluhlstrasse 5, 7611, Steinach, Germany
Filed Apr. 18, 1973, Ser. No. 352,449
Claims priority, application Germany, Apr. 22, 1972, 2219901
Int. Cl. E04g *11/02*
U.S. Cl. 249—19 **49 Claims**

A pair of transversely spaced upright angle units each have upper end portions and an upright wall panel provided with a lower end portion. Ceiling panels are pivoted to the respective upper end portions, and adjustable braces pivotally connect the angle units with one another and with a floor, and also pivotally connect the ceiling panels with the respective angle unit. Each angle unit has at least one rotatable element associated with it and with its braces, and the rotatable elements are turnable about respective horizontal axes and are connected with the braces so as, when turned, to displace the angle units toward or away from one another and also to raise or lower the ceiling panels, depending upon the direction of



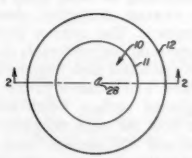
rotation of the rotatable elements, for respectively erecting and striking the form.

3,815,862
WALER-POSITIONING SUPPORT FOR ACCOMMODATING TWO DIMENSIONAL STANDARDS IN FORM LUMBER
Chester I. Williams, 347 Greenbriar S.E., Grand Rapids, Mich. 49506
Filed Mar. 15, 1973, Ser. No. 341,701
Int. Cl. E04g *11/08*
U.S. Cl. 249—40 **6 Claims**



A waler support for wall form systems used in confining poured concrete is adapted for installation in either of two positions corresponding to the use of lumber of two sizes or dimensional standards to retain accurate form-spacing relationships in both cases.

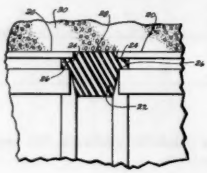
3,815,863
COLLAPSIBLE FLEXIBLE MATERIAL CANDLE MOLD
Fritz J. Andeweg, 7737 Royal Ln., Dallas, Tex. 75230
Filed June 13, 1972, Ser. No. 262,245
Int. Cl. B29c *1/12*; **B28b** *7/32*
U.S. Cl. 249—178 **6 Claims**



An inflatable mold system for internally illuminated candles burnable from the top having a cavity within wax of the can-

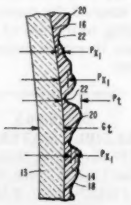
dle. The mold system includes irregularly shaped portions and an enlarged portion collapsible for easy removal from an internal cavity in the candle.

3,815,864
ELASTOMERIC JOINT SEAL
Frederick W. Loeber, Downey, Calif., assignor to Ameron Inc., Monterey Park, Calif.
Filed May 24, 1972, Ser. No. 256,306
Int. Cl. B28b 7/30
U.S. Cl. 249—179 5 Claims



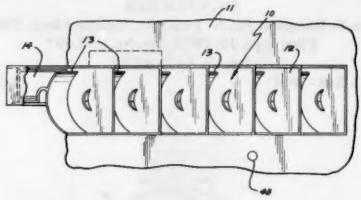
An inner form for a concrete mold assembly includes adjoining retractable wall sections, and a substantially nonporous, deformable elastomeric joint seal between the wall sections. A retracting force applied to the wall sections exerts pressure on the seal to squeeze the seal and thereby shrink the size of the inner form in preparation for the lifting of a concrete casting over the form. During casting operations, the outer surface of the joint seal is flush with the outer surfaces of the adjacent wall sections. The joint seal is configured so that the pressure applied by the edges of the wall sections is induced eccentric to the centroid of the seal to substantially prevent the outer surface of the seal from bulging beyond the outer surfaces of the adjacent wall sections. This prevents the seal from being abraded away by the concrete casting when it is lifted over the form.

3,815,865
THERMOPLASTIC SHIELDED GLASS BOTTLE WITH HIGHLY ROUGHENED SURFACE
Edward R. Campagna, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 18, 1972, Ser. No. 245,068
Int. Cl. B65d 23/08
U.S. Cl. 215—1 C 6 Claims



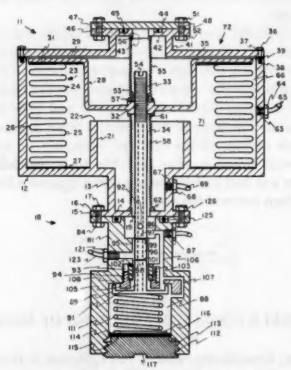
A container comprising an inner glass receptacle and a closely adhering exterior protective sheath substantially covering said receptacle. The exterior protective sheath is comprised of a shape-retaining, preferably thermoplastic resin adapted to restrain and retain glass fragments should the glass receptacle be broken. The sheath is further provided with a substantially roughened surface which exhibits a surface elevation variance from the mean thickness of the sheath by between about 50 and 120 percent. Such surface characteristics in addition to their functional effects also produce interesting and attractive optical characteristics and substantially reduce the light transmittance thereof.

3,815,866
PROPORTIONAL ON/OFF VALVE
Gary J. Wirth, St. Paul, Minn., assignor to Uniflo Systems Company, South Minneapolis, Minn.
Filed June 2, 1972, Ser. No. 259,170
Int. Cl. B61b 13/08; F16k 31/145
U.S. Cl. 251—25 5 Claims



A valve for controlling thrust for levitated vehicles from a source of fluid under pressure to a vehicle that is being levitated and propelled, and used in combination with a vehicle speed control system that uses the time of movement of a vehicle from one point to another as a reference. The amount of opening of the valve is adjusted in accordance with the speed of the vehicle which is to receive thrust from the thruster device.

3,815,867
PRESSURE REGULATOR
Charles R. Rein, and Charles B. Jones, both of Panama City, Fla., assignors to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 16, 1973, Ser. No. 351,753
Int. Cl. F16k 31/145
U.S. Cl. 251—61.3 10 Claims



A pressure regulator is disclosed as comprising a valve body having a first chamber, a second chamber, an open-ended bore disposed between said first and second chambers, and a third chamber extending from said second chamber. An entrance passageway extends through said valve body to effect fluid communication between said bore and the outside of said valve body. An exit passageway extends through said valve body to effect fluid communication between said first chamber and the outside of said valve body. A porous ring having an inside diameter equal to the inside diameter of said bore is located within said second chamber in contiguous disposition with said bore. A retention nut is connected between said porous ring and the inside diameter of said second chamber for retention of said porous ring therein, so

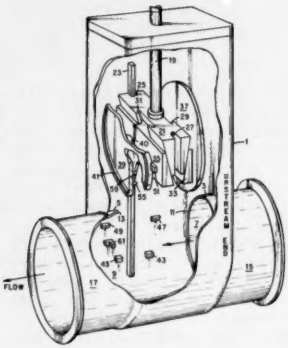
that a portion of said second chamber extends around a portion of the outside surface thereof. A valve extends through said first chamber, through said bore for slidable movement therein, and through said porous ring in such manner as to effect metered fluid communication between said entrance and exit passageways through a portion of the aforesaid porous ring in accordance with the position thereof therein. An intermediate passageway interconnects a portion of said first, second, and third chambers and the aforesaid exit passageway. A bellows assembly is connected between one end of said valve body and said valve for effecting the movement thereof, in direct proportion to a controlling fluid presure applied thereto.

3,815,868

GATE VALVE

Gerald Bobo, Waverly; James H. Hipple, Piketon, both of Ohio, and Edward M. Petrosky, Latrobe, Pa., assignors to The United States of America, as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed June 6, 1973, Ser. No. 367,681
Int. Cl. F16k *3/04*
U.S. Cl. 251—86 **7 Claims**



A double-disc gate valve of the kind wherein rotatable valve discs are lowered to a selected position within a casing and then moved transversely outward to close inlet and outlet ports of the valve. In some applications of such valves, the process fluid differential pressure skews the downstream disc assembly during opening of the valve. To eliminate resulting undesirable effects, the downstream disc of the present valve is provided with a pair of oppositely disposed, laterally projecting arms which during transverse movement of the disc are engaged by hold-down lugs in the casing. If, because of skewing, one of the disc arms is still engaged by its hold-down lug at a time when the valve discs are being lifted, the resulting rotational force applied to the downstream disc causes it to rotate, freeing the downstream assembly.

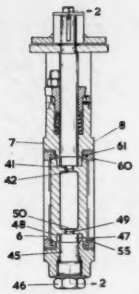
3,815,869

BUTTERFLY DISC VALVES

Ronald Gordon Smith, Norfolk, England, assignor to Sir W. H. Bailey & Co. Limited, Manchester, England

Filed Feb. 20, 1973, Ser. No. 334,109
Claims priority, application Great Britain, Feb. 24, 1972, 8509/72
Int. Cl. F16k *1/228*
U.S. Cl. 251—306 **11 Claims**

A fluid-flow control valve comprising a body having a passageway therethrough, a butterfly disc mounted in said body and rotatable to and from a position closing said passageway, and an annular seating on the body and an annular face on the butterfly disc for sealing together when the butterfly disc closes the passageway, one of said seating and said face being formed of two side-by-side annular portions of dissimilar materials and the butterfly disc being displaceable along the passageway whereby the butterfly disc will close the passageway even if one of said dissimilar material is destroyed.

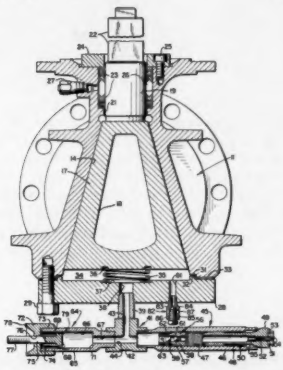


3,815,870

PLUG VALVE ASSEMBLIES

Bertram J. Milleville; Earl A. Bake, both of Pittsburgh, and William G. Lunt, Monroeville, all of Pa., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed May 26, 1972, Ser. No. 257,397
Int. Cl. F16k *5/02*
U.S. Cl. 251—309 **12 Claims**



A non-lubricated tapered plug valve assembly for controlling flow of alumina slurries and like deposit forming substances has a rotatable wide angle torsionally elastic plug across the larger end of which extends a body chamber filled with thixotropic plastic sealant to effectively block entry of deposit-forming line fluid into the chamber, with provision for pressure relief to prevent assembly pressure locking as a result of cycling of line fluid temperature or pressure.

3,815,871

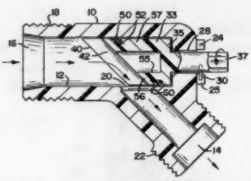
HOLLOW POPPET VALVE

Glen R. Carlson, Northridge, Calif., assignor to The Celotex Corporation, Tampa, Fla.

Filed Aug. 30, 1972, Ser. No. 285,063
Int. Cl. F16k *5/04*
U.S. Cl. 251—310 **6 Claims**

A hollow poppet valve is provided with a diagonal *O*-ring seal surrounding a hollow poppet valve stem having a sloping leading edge. The valve also has a smooth, curved lip adjacent

the inner rim of the discharge passage which contacts the *o*-ring when the hollow poppet valve stem is rotated from a



closed to open position or the reverse. A rounded groove in the face of the valve stem prevents *o*-ring lift-off with high velocity fluid flow.

3,815,872

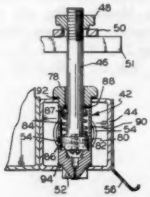
APPARATUS FOR TREATING FABRIC ITEMS

Elmer M. Dunn, 1894 Northview Dr. N.E., Salem, Oreg. 97303

Division of Ser. No. 888,541, Dec. 29, 1969, Pat. No. 3,687,102. This application May 22, 1972, Ser. No. 255,896

Int. Cl. B05b *1/00*; F16k *1/00*

U.S. Cl. 251—323 **1 Claim**



Apparatus for treating fabric items such as mops, mats, rugs, and the like with a dust control fluid includes a conveyor for moving such items with respect to a plurality of rollers. The first roller senses the presence of the item and initiates a measured spray of dust control fluid. A pervious roller, e.g. a felt roller, absorbs excess fluid from the item and spreads the fluid evenly, while a hard-surfaced roller urges the fluid into the item. For processing rugs, a rotating brush is employed for raising the nap of the rug after treatment.

3,815,873

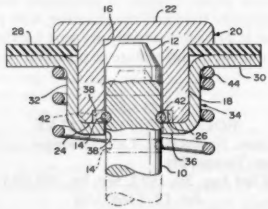
VALVE ASSEMBLY

Fred W. Hendrick, Long Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 7, 1973, Ser. No. 367,910

Int. Cl. F16k *25/00*

U.S. Cl. 251—337 **10 Claims**



A valve assembly including a split retaining ring captured in a recess between a retainer and a backup plate, and a valve stem having a tapered end received in a cavity in the retainer and a circumferential groove receiving the split retaining ring to lock the valve assembly together, the split retaining ring being expandable to ride over the surface of the valve stem from the tapered end to the groove to facilitate assembly.

3,815,874

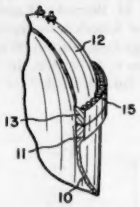
BOLT TENSIONING DEVICE ESPECIALLY ADAPTED FOR USE WITH NUCLEAR REACTOR PRESSURE VESSEL

Cecil R. Jones, Hamden, Conn., assignor to Transfer Systems Incorporated, New Haven, Conn.

Filed Oct. 18, 1971, Ser. No. 190,097

Int. Cl. E21b *19/00*

U.S. Cl. 254—29 A **12 Claims**



An improved bolt tensioning device for use for loosening or tightening the bolts which secure the pressure head to a nuclear reactor pressure vessel is described. The improved tensioner comprises a head bearing member which surrounds the bolt nut and has an annular ledge defining with an overlying complementary mating piston member an annular pressurized fluid receiving chamber. A connection to the bolt stud is constituted by a split sleeve or ring which is placed in threaded engagement with the stud above the fluid receiving chamber and held in place therein by a surrounding retainer sleeve via matching tapered surfaces. A bearing washer with curved bearing surface is interposed between the upwardly urged complementary member and the split ring for transmitting the upward force to the latter and via the latter to the stud.

3,815,875

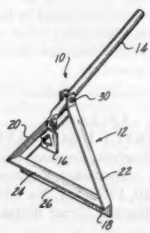
PORTABLE STAKE REMOVER

Alan D. Koebel, Jr., Southfield, Mich., assignor to James L. Hulet, Roseville, Mich.

Filed Oct. 24, 1972, Ser. No. 300,217

Int. Cl. B66f *3/00*

U.S. Cl. 254—132 **1 Claim**

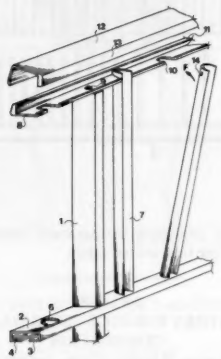


A portable stake remover having an elongated arm pivotally mounted on a base that is positioned adjacent the stake. A jaw having a generally triangularly shaped opening for receiving the stake is carried on the arm. As one end of the arm is swung downwardly in a vertical motion, the jaw carried on the opposite end of the arm, pulls the stake from the ground.

3,815,876
GUARD-RAIL AND METHOD OF ASSEMBLY THEREOF

Jean-Michel Saez, Zone Industrielle, Muret, France

Filed Nov. 24, 1972, Ser. No. 309,464
Claims priority, application France, Nov. 29, 1971, 71.42605
Int. Cl. E04h 17/16
U.S. Cl. 256—22 6 Claims

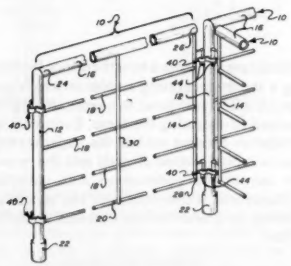


The invention relates to an improved guard-rail, such as a protective guard-rail or a guard-rail forming a fence, characterized in that each bar may be put in place individually by fastening its lower end to a bottom rail and by inserting its upper part into a notch in a top rail, the notch being open on one side of the rail. A hand-rail comprising a flange is then attached to top rail, the hand-rail closing off the notches in the top rail and thus securing the bars and integrating them into the structure.

3,815,877
FENCE PANEL CONSTRUCTION

Joe D. Turner, Box 157 S. Star Rte., Corrales, N. Mex. 87048

Filed Aug. 4, 1972, Ser. No. 278,062
Int. Cl. E04h 17/16
U.S. Cl. 256—24 5 Claims

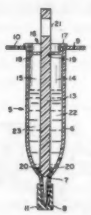


A free-standing metal fence construction for use in forming enclosures such as corrals, pens, and stalls for horses and other animals consisting of modular panels provided with pin-engaging fastening means which permit the pivotal interconnection of a plurality of such panels at a common location. Each panel employs two laterally spaced upright members joined by a plurality of horizontal rails positioned between the end members with any desired vertical separation, one of the upright members consisting of a ground supported tubular post and the other consisting of a vertical rod terminating at a predetermined distance above the ground at which point it is connected to the post by one of the rails. Two vertically aligned pin-engaging fasteners attached to the post, and spaced apart above each other, consist of corrugated metal straps partially encircling the post to form a number of vertically directed apertures, the groove of each corrugation in contact with the post being secured by means of a vertical weld. A pair of correspondingly spaced fastening pins, smaller in size than the apertures, are attached to the vertical rod and extend downward from their points of attachment. In use, the pair of pins associated with one such panel may be passed through any two upper and lower aligned apertures respectively of the pair of fasteners of any other such panel to pivotally interconnect the two panels at any desired angle. The remaining pairs of matching upper and lower apertures of the fasteners are adapted to accomodate simultaneously a like number of additional pairs of such pins so that one can interconnect at a common point as many panels as there are apertures in each fastener, in addition to the panel to which the pair of fasteners themselves are attached.

3,815,878
DISPOSABLE MIXING SYRINGE

Morris J. Baskas, and Harry Kaufman, both of New Rochelle, N.Y., assignors to Dentipressions Inc., New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,106
Int. Cl. B01f 7/00; A61k 5/02
U.S. Cl. 259—37 8 Claims



A disposable mixing syringe is described. It comprises a barrel containing a removable centerboard dividing it into two compartments each for receiving one component of a mixture to be formed and terminating in a small orifice. The opposite barrel end is open and adapted to receive a slotted cup, through the slot of which passes an extension of the centerboard. Removing the centerboard allows mixture of the components by inserting a mixing tool, after which a suitable plunger is provided to expel the mixed contents through the orifice.

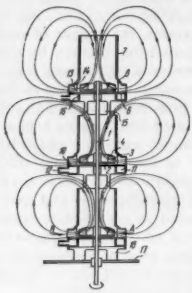
3,815,879
DEVICE FOR STIRRING AND AERATING LIQUIDS IN MASS-EXCHANGE APPARATUS

Evgeny Leonidovich Mikhailov, ulitsa Kurchatova, 5, kv. 22, Irkutsk; Valery Ivanovich Boiko, Irkutskoi oblasti, ulitsa Sovetskaya, 13, kv. 14, Angarsk; Peter Ivanovich Nikolaev, ulitsa Pulkovskogo, 27, kv. 105, Moscow; Innokenty Alexandrovich Melnikov, ulitsa Kurchatova, 5, kv. 41, Irkutsk; Vladimir Alexandrovich Eremin, Snaiperskaya ulitsa, 10, korpus 1, kv. 64, Moscow; Vyacheslav Georgievich Revazov, ulitsa Kurchatova, 9, kv. 7; Jury Iosifovich Jurievich, ulitsa Kurchatova, 5A, kv. 38, both of Irkutsk, and Gennady Evgenievich Losev, ulitsa Zelenodolskaya, 19, korpus 2, kv. 1, Moscow, all of U.S.S.R.

Filed July 10, 1972, Ser. No. 270,285
Int. Cl. B01f 7/26
U.S. Cl. 261—93 5 Claims

A device wherein disks (2) parallelly fixed on shaft (1) are supplied with blades (3) and separated from each other with

baffles (6), each of said baffles carrying a cylinder (7) having beading (8) which in combination with the baffle (6) forms an



annular slot (9) providing a directed liquid circulation in the apparatus.

3,815,880

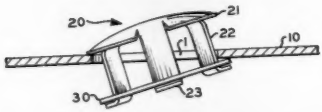
VALVE MECHANISM FOR FLUID CONTACT APPARATUS

David B. Price, Kansas City, Kans., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 27, 1972, Ser. No. 309,696

Int. Cl. B01f *3/04*

U.S. Cl. 261—144 VT **6 Claims**



In a fluid contact apparatus, a valve assembly in association with a contact tray, said tray having at least one flow opening therethrough, said flow opening having said valve assembly installed therein, said valve assembly comprising a cover, laterally spaced legs depending therefrom and extending through said flow opening, each of said legs having an outwardly facing foot attached at the extremity thereof, and a travel limiting means, said travel limiting means being at least reciprocally movable on said legs below the underside of said plate.

3,815,881

TUBE ANNEALING APPARATUS AND METHOD

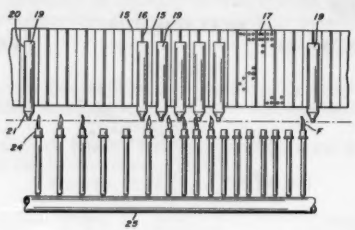
Milton H. McCann, Wheeling, W. Va., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 210,502, Dec. 21, 1971, Pat. No. 3,776,785. This application Mar. 8, 1973, Ser. No. 339,357

Int. Cl. C21d *9/08*

U.S. Cl. 266—5 F **5 Claims**

An apparatus and method for annealing thin-walled metal tubes which comprise a body portion and a tapered shoulder portion which has a relatively thickened wall. The tubes are disposed upon a transport conveyor which rapidly moves tubes through an annealing furnace wherein a first heat source is disposed for maintaining a uniform high temperature within the chamber, and wherein a second heat source comprising a plurality of combustion flame burners are disposed within the chamber along the path of travel of the conveyor. The flame emanating from the second combustible flame burners is directed upon the shoulder portion of the tubes which are passed through the annealing furnace. The tubes are rapidly



brought to the annealing temperature without rupture or deformation of the thin-walled tubes.

3,815,882

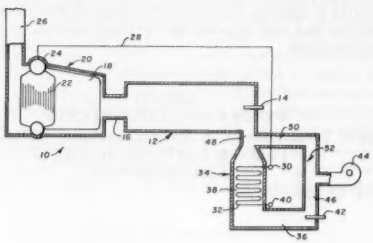
REVERBERATORY FURNACE USING WASTE GAS FOR COMBUSTION

John William Regan, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 15, 1972, Ser. No. 315,707

Int. Cl. F27d *17/00*

U.S. Cl. 266—19 **7 Claims**



This disclosure involves a reverberatory furnace installation including a steam generating system in which auxiliary steam for the process is superheated in a separately fired superheater and a method of operating the same. Excess air is employed in the combustion process within the superheater and the exhaust gas therefrom passed directly into the reverberatory furnace for use in the combustion and reduction processes therein. Superheat temperatures of the steam are controlled by regulating the amount of air supplied to the burners of the superheater.

3,815,883

METHOD AND APPARATUS FOR CONTROLLING HEAT EFFECT IN METAL CUTTING OPERATIONS

Charles A. Van Horn, Country Club Hills, Ill., assignor to Chemetron Corporation, Chicago, Ill.

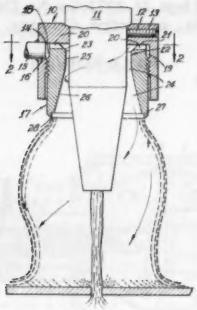
Filed Dec. 23, 1971, Ser. No. 211,217

Int. Cl. B23k *7/00*

U.S. Cl. 266—23 T **8 Claims**

In a metal cutting apparatus of the type which cuts the metal workpiece by directing a jet of cutting gas against a pre-heated portion of the workpiece, a combination of a cutting tip and a

hollow conical coolant nozzle which discharges a swirling sheet of coolant is used to control the distortion and localized



hardening of the work caused by the heat effect of the cutting operation.

3,815,884

CUTTING APPARATUS FOR LARGE PLATES

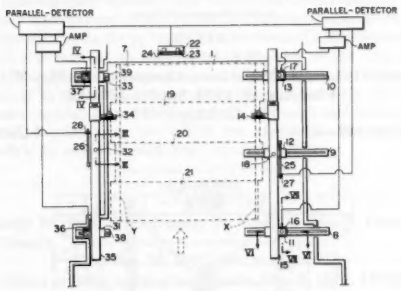
Kazuo Sekine; Michio Mimura, both of Yokohama, and Yasuhiko Oniki, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1972, Ser. No. 318,490

Claims priority, application Japan, Feb. 8, 1972, 47-013271

Int. Cl. B23k *7/02*

U.S. Cl. 266—23 K **14 Claims**



The longitudinal ends or edges of a large plate composed of a plurality of unit plates welded together are not uniform or even and therefore the large plate cannot readily be utilized in that condition. In other words, the uneven portions on both ends of such a large plate must be cut to produce parallel ends. A cutting apparatus for large plates is provided, which mainly comprises a pair of rails disposed along the ends of a large plate and extending in the longitudinal direction thereof, a pair of cutting machines mounted on the rails to travel thereon, and a deviation detector for detecting the amount of deviation of position of a stopped large plate, whereby in accordance with the value of a detected deviation, the two rails are rotated in a parallel relation over the surface of the large plate to determine the cutting lines along the ends of the large plate, and the cutting devices are then brought into operation to remove the desired amount from both ends of the plate to produce the parallel ends.

3,815,885

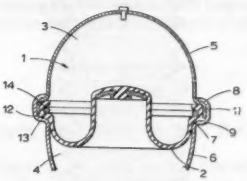
PRESSURE VESSELS

Alexander Eric Moulton; Philip Basil Uncles, both of Bradford-on-Avon; John Derek Slade, Balsall Common, and Kenneth John Taylor, Nuneaton, all of England, assignors to Moulton Developments Limited, Wiltshire, England

Continuation-in-part of Ser. No. 108,761, Jan. 22, 1971, abandoned. This application Oct. 10, 1972, Ser. No. 295,920

Int. Cl. F16f *5/00*

U.S. Cl. 267—65 B **20 Claims**



The invention relates to a pressure vessel comprising a two-piece shell with a flexible sealing separator dividing the internal volume of the shell into two chambers. Each shell portion is provided with a substantially cylindrical mating portion of increased internal diameter extending around its mating edge, with the mating edges of the two shells being united with one another and wherein the peripheral edge of the flexible sealing separator is trapped between two mating edges and between an internal metal ring member. The invention further provides a resilient hydropneumatic vehicle wheel suspension unit incorporating such a pressure vessel.

3,815,886

SPRING MEANS

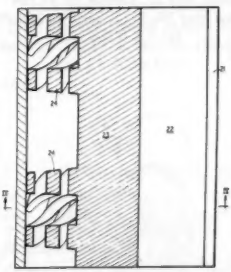
Cecil Robert Montgomery Graham, Killara, New South Wales, and Lambert Ronald Little, North Epping, New South Wales, both of Australia, assignors to Samuel Taylor Pty. Limited, Artarmon, New South Wales, Australia

Filed Jan. 24, 1972, Ser. No. 220,205

Claims priority, application Australia, Jan. 27, 1971, 3833/71

Int. Cl. F16f *1/06*

U.S. Cl. 267—180 **7 Claims**

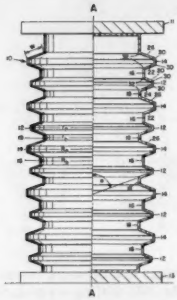


A spring means formed integrally with a base the spring means consisting of a number of leaves projecting from the base at spaced intervals around a point, the leaves being all angularly inclined to the base and extending along helical paths in the same direction and being arranged so that spaces are left between them in an axial direction. It is preferred that the base and the leaves are moulded together for example, by injection moulding from a synthetic plastic material. The spring means are of general applicability but have a special application in connection with aerosol valves.

3,815,887
PLASTIC SPRING

William R. Curtis, Newark, and David C. Trimble, Yorklyn, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 21, 1972, Ser. No. 236,621
Int. Cl. F16g *3/08*
U.S. Cl. 267—91 18 Claims

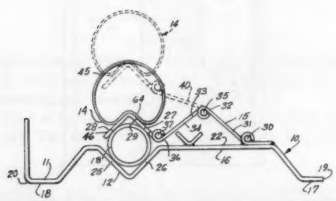


A thin wall hollow, corrugated plastic spring is provided which has a plurality of annular peaks, each separated by a respective one of a plurality of annular valleys. A first group of bottoms of respective valleys are spaced a first distance from the longitudinal axis of the spring and a second group of valley bottoms, each of which alternate with a bottom of the first group, are spaced a second distance from the longitudinal axis of the spring. The peaks are arranged in the manner as the valley bottoms thereby providing a telescopic effect of the valley bottoms and a telescopic effect of the peaks when the spring is fully compressed. As modifications, all of the peaks may be at the same distance from the longitudinal axis while the distances of the valley bottoms vary as above described or vice versa. This provides for a telescoping effect of either the peaks or the valley bottoms. The spring rate is non-linear. The spring is preferably made of polypropylene and has primary utility in seating and reclining applications such as chairs, sofas, and bedding.

3,815,888
VISE FOR PLASTIC PIPE

Willard E. Kentner, Box 35, Eldena, Ill. 61324

Filed May 30, 1972, Ser. No. 258,058
Int. Cl. B25b *3/00*
U.S. Cl. 269—2 8 Claims

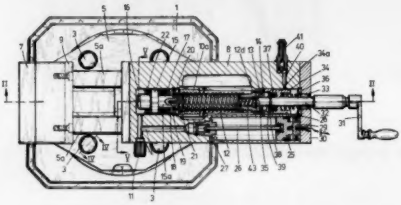


A vise for holding plastic pipe so that it may be sawed to length or otherwise worked on. The vise has a base member with a V-groove jaw therein and a movable opposed "V" jaw with a gripping handle thereon. The movable opposed "V" jaw is attached to the base member through a multiple articulated connection having two members pivoted together at one end, each member having its other end in pivoted connection to the base or the handle member.

3,815,889
VISE

Albrecht Weber, Hilchenbach, Germany, assignor to Maschinenfabrik Hilma Gesellschaft mit Beschrankter Haftung, Hilchenbach, Germany

Filed Sept. 21, 1972, Ser. No. 290,864
Claims priority, application Germany, Sept. 21, 1971, 2146996
Int. Cl. B25b *1/18*
U.S. Cl. 269—28 4 Claims

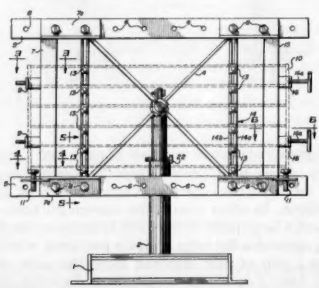


A vise having a fixed clamping jaw and a clamping carriage mechanically movable relative to the clamping jaw by means of a threaded spindle. Such vise is equipped with a fluid pressure operable amplifier, the amplifying pressure of which is conveyed to a high pressure chamber provided in the clamping carriage. The supply of pressure medium is controlled by valve means. These valve means include a valve sleeve arranged on the coupling shaft and furthermore include control bores provided in the clamping carriage. When the clamping carriage engages the work piece, the valve is opened by means of an axial relative motion of a coupling shaft which is connected with the spindle means of a disengageable clutch. The coupling shaft is operated by a crank handle which, when the clutch is engaged, also effects the mechanical feeding movement of the clamping carriage by means of the spindle.

3,815,890
WELDING JIG

Leonard Urban, 10909 Cordova, Albuquerque, N. Mex. 87112

Filed Aug. 10, 1972, Ser. No. 279,452
Int. Cl. B23p *15/12*
U.S. Cl. 269—43 3 Claims



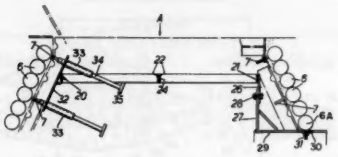
A method and mechanism for assembling, clamping and welding metal frames and gratings comprising a support frame rotatably mounted about its center in a vertical plane and employing means for holding a plurality of pieces of bar stock in juxtapositioned, predetermined spaced rows. End members are held against the ends of the bar stock and welded thereto to form the frame or grating structure.

3,815,891

JIG FOR POSITIONING THE STUDS FOR THE QUARL TILES

William Brown Black, Kilbarchan Rd., Bridge of Weir, Penwold, Renfrewshire, Scotland

Filed Mar. 5, 1973, Ser. No. 337,909
Claims priority, application Great Britain, May 30, 1972, 25160/72
Int. Cl. B23q 3/18
U.S. Cl. 269—45 1 Claim



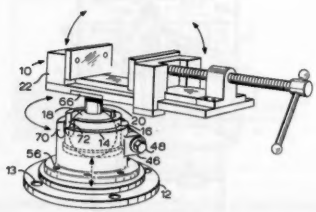
For use in the course of forming a venturi-shaped flame-ignition throat in a venturi-shaped duct in a boiler, the jug being used for the positioning of studs for welding to circulation tubes so as to extend from the latter inwards in the direction of the duct axis, the tubes being disposed in banks at each of two diametrically opposed regions of the duct in non-contiguous relationship over the major parts of their lengths with their axes following the curvature of the duct in planes normal or substantially normal to said circulation axis, the jig comprising an internally-braced metal ring of diameter to fit with clearance within the smaller diameter end of either one of the truncated conical lengths of the duct, L-shaped support brackets secured to the external periphery of said ring at circumferentially spaced locations and providing first limbs parallel to the ring axis and outwardly projecting second limbs spaced from and parallel to radii of said ring, the first limbs being adjustable in length and the second limbs having therein elongate holes enabling positional adjustment relative thereto of locating studs welded to the circulation tubes closest to the larger diameter end of said either one truncated conical length of the duct to fix the jig in position, sections of a frusto-conical skirt also secured to the external periphery of the ring and mounting mandrel-guiding tubes whereof, in use, the axes are normal to the axes of other circulaton tubes at said two opposed regions and mandrels insertable through said tubes and having tapped ends into which are adapted to be screwed studs to be welded to said other circulation tubes.

3,815,892

VISE

George M. Tulk, 2469 Dundas St. West, Toronto 9, Ontario, Canada

Filed Nov. 10, 1972, Ser. No. 305,573
Claims priority, application Canada, May 5, 1972, 141459
Int. Cl. B23q 1/12
U.S. Cl. 269—75 13 Claims



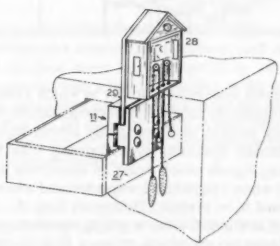
An angularly adjustable support for a vise or the like comprises a housing having a cylindrical chamber formed therein, a sleeve slidably mounted in the chamber for movement between an elevated and a lowered position, a ball-shaped member mounted in the sleeve for rotation about the center of gyration and a support shaft connected at one end to the ball-shaped member and extending radially outwardly therefrom. In addition, the ball-shaped member is rotatable about its center of gyration when the sleeve is in the elevated position to dispose the support shaft in a first position axially aligned with the cylindrical chamber of the second position substantially at right angles to the first axially aligned position. The ball member is rotatable about an axis which is coextensive with the axis of its shaft. Clamping means is provided for releasably clamping the ball member with respect to the sleeve and housing within the range of movement of the ball relative to the sleeve.

3,815,893

CLOCK REPAIR JIG

Gerbrand Engels, 4162 Fairmont Ave., San Diego, Calif. 92105

Filed Oct. 19, 1972, Ser. No. 298,957
Int. Cl. B23q 3/02; B25b 5/10
U.S. Cl. 269—98 1 Claim



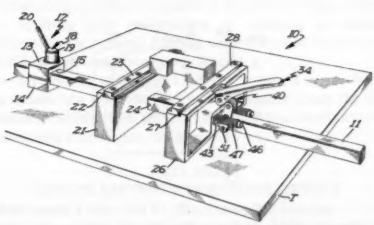
A clock repair jig particularly designed for the positioning of cuckoo clocks consisting of a dual arranged clamp for clamping to the top of a drawer or any other suitable vertical plate for positioning the clock in its upright working position for an easy access to the inside or outside mechanism.

3,815,894

CAM LOCK VISE

John L. Olson, 1300 Birch St., North Branch, Minn. 55056

Filed Feb. 16, 1972, Ser. No. 226,670
Int. Cl. B25b 1/02
U.S. Cl. 269—167 6 Claims



A quick acting cam lock vise for use with drill presses and the like comprises fixed and movable jaws mounted on an elongate mounting bar. A spring urged over center toggle linkage is connected with a movable jaw and is operable to cam the jaw into gripping relation with the work piece, and is also operable to releasably lock the movable jaw with respect to

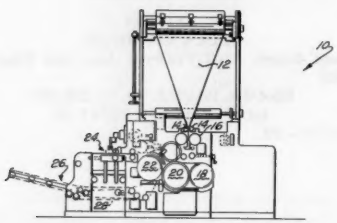
the mounting bar. The toggle linkage includes a lock actuating member operatively connected with a pair of concavo-convex locking elements which grip the mounting bar when the toggle linkage is in the locking position.

3,815,895

JAM DETECTOR SYSTEM

Charles H. Dufour, Westerly, R.I., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 7, 1970, Ser. No. 95,442
Int. Cl. B65h 43/02
U.S. Cl. 270—56 15 Claims



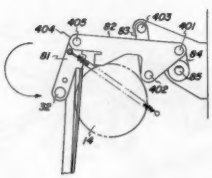
A jam detector system for a folder in which photocells are placed at strategically located inspection stations to inspect for wrongfully present and wrongfully absent signatures. A timing mechanism operating synchronously with the folder provides gating signals which cause an inspection to be made both at times when a signature is expected and when no signature is supposed to be present. The signals from the inspecting photocells are combined with the gating signals to provide the logic for a logic circuit which, when a fault is detected, is operable to stop the folder. The system is also operative to stop the folder in the event of a malfunction, such as a burned out light source, in the detector system.

3,815,896

AUTOMATIC DOCUMENT HANDLER

August Hoyer, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 8, 1972, Ser. No. 250,904
Int. Cl. B65h 1/26
U.S. Cl. 271—4 2 Claims



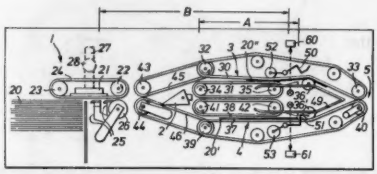
An automatic document handler for supplying documents singly to the platen of a processing apparatus such as a copying machine. Following copying, each document is returned to the document supply where the used documents are kept separated from documents awaiting copying by means of a resettable bail bar.

3,815,897

ARRANGEMENT FOR THE CONTROLLED DISCHARGE OF INDIVIDUAL FLAT ITEMS

Bernhard Hoehl, Constance-Litzelstetten, and Hans Rapparlie, Konstanz, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 31, 1973, Ser. No. 384,173
Claims priority, application Germany, July 31, 1972, 2237637
Int. Cl. B65h 3/44
U.S. Cl. 271—9 14 Claims



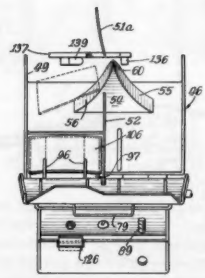
An arrangement for the controlled discharge of individual flat items from a stack of items. A separator removes the items from the stack and sequentially feeds the items into two conveying channels, which channels are disposed so they converge at a common discharge point. A controllable release device is arranged along each of the channels. Each release device has an abutment, which can be moved into position to prevent continued movement of an item through the channel, and an acceleration member, which is moved into position to accelerate the discharge of the item from the channel when the abutment is moved out of the path of the item. A signal generator is arranged along each of the channels so as to provide a signal indicative of the presence of an item within the channel. The output signals of the signal generators are coupled to a control circuit, which prevents an item from being fed into any channel already occupied by an item. A discharge circuit selectively provides discharge signals to each of the controllable release devices for controlling the position of the abutments and the acceleration members for controlling the continued passage of items along the respective channel to the discharge point.

3,815,898

LABEL HANDLING MECHANISM

William E. Haifley, Bluffton; Robert D. Kennerk, Fort Wayne, and Richard E. Woods, Markle, all of Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed May 24, 1972, Ser. No. 256,265
Int. Cl. B65h 29/58; B32b 31/00
U.S. Cl. 271—65 11 Claims



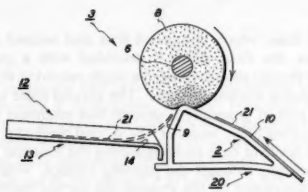
This disclosure deals with a mechanism for handling a label issued by a label printing mechanism of, for example, auto-

matic weighing, computing and labeling apparatus. Such a label has printing on one side thereof, and the label moves downwardly in a substantially vertical plane as it leaves the label printing mechanism. The mechanism includes a diverter positioned in the path of the label, the diverter deflecting the label laterally to place the printing either facing upwardly or facing downwardly. After being deflected, the label slides to a removal station where it may be picked up either manually or automatically. When the label includes a heat activatable adhesive on its side opposite the printing, the mechanism further includes a heater which may be used to activate the adhesive.

3,815,899
SHEET DELIVERY DEVICE

John F. Hatzmann, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1973, Ser. No. 342,654
Int. Cl. B65h *29/22*
U.S. Cl. 271—80 **15 Claims**

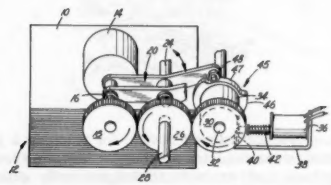


A sheet delivering and propelling device for use in a reproducing machine for moving copy sheets from the end of a delivery or processing surface to a collecting tray. The device comprises resilient foam rolls mounted on a delivery shaft which extends substantially across the width of the machine and generally vertically above a downwardly inclined portion of the processing surface. The outer radius of each roll is greater than the distance between the axis of the delivery shaft and the top surface of the processing surface to thereby continuously compress and release radial sectors of the foam rolls which, after passage of the sheets thereunder, momentarily thrust the sheets toward the collecting tray.

3,815,900
HIGH SPEED DOCUMENT FEED

Erwin F. Schulze, Novelty, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 2, 1973, Ser. No. 328,971
Int. Cl. B65h *3/06*
U.S. Cl. 271—118 **2 Claims**

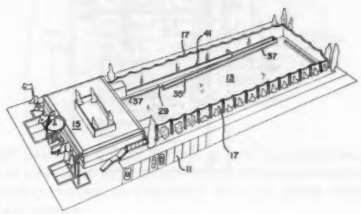


An apparatus for the seriatim feeding of documents from a stack at high speeds. A friction feed roller is arranged to move in and out of contact with a stack of documents. As the roller approaches the stack of documents there is little or no relative movement between the roller and a document in a feed direction. On contact with the document, the roller begins to accelerate causing a smooth transition from standing to moving as the document is fed.

3,815,901
SKI ARENA

Erling Ostratt Wiig, 1291 Oakland Blvd., Walnut Creek, Calif. 94546

Filed Nov. 24, 1972, Ser. No. 309,144
Int. Cl. A63g *21/00*; **A63j** *3/00*
U.S. Cl. 272—3 **1 Claim**

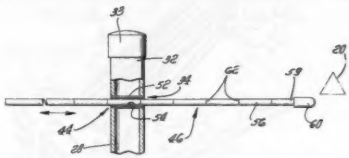


A skiing facility having a snow surface which may be cooled by means disposed beneath said surface, and having down-slope and up-slope areas interconnected by an intermediate transition portion with a building facility at the end of the up-slope area, said skiing area having guard rails along the sides thereof with a ski lift disposed along at least one of said sides for transporting skiers from said intermediate portion to the top of the down-slope area.

3,815,902
MEASURING MEANS FOR POLE VAULTER

John R. Tomlinson, Long Beach, Calif., assignor to Sky Pole Manufacturing, Inc., Costa Mesa, Calif.

Filed Mar. 15, 1973, Ser. No. 341,380
Int. Cl. A63b *5/16*
U.S. Cl. 272—59 C **7 Claims**



A measuring structure adapted to be utilized with a conventional vaulting pole preliminary to vaulting to assure a predetermined horizontal spacing of an elevated cross bar forward of a designated pivot ground point.

The measuring structure includes an opening in the pole and a measuring element which is adjustable along the opening and removable from the pole and also preferably contains measurement increments marked thereon.

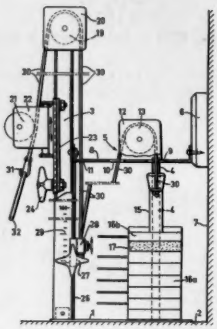
3,815,903
WEIGHT LIFTING EXERCISING DEVICE

Olle Blomqvist, Fack, 100 51, Stockholm 28, Sweden

Continuation of Ser. No. 30,440, April 21, 1970, abandoned. This application June 26, 1972, Ser. No. 266,509
Claims priority, application Sweden, Mar. 16, 1970, 3444/70
Int. Cl. A63 *21/06*
U.S. Cl. 272—81 **3 Claims**

A physical exercise equipment, in the form of a pulling apparatus, having a weight, to which a string is attached, which is

reeved over a number of pulleys, and a hand grip at the free end of the string. At least one of said pulleys is a displaceable lockable sheeting pulley, through the displacement of which



the length of a looped portion of the string and accordingly also the length of the free end portion of the string is adjustable. The height of the sheeting pulley may be read on a scale.

3,815,904

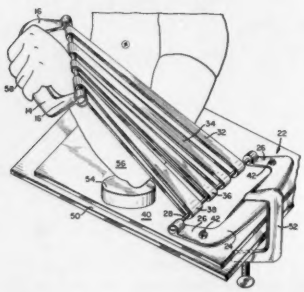
SPRING-TYPE EXERCISING DEVICE

Marcel Weiss, Brooklyn, and Samuel Kallus, Jackson Heights, both of N.Y., assignors to Swedish Health Products, Inc., Jackson Heights, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,607

Int. Cl. A63b *21/00, 21/20*

U.S. Cl. 272—82 **6 Claims**



An exercising apparatus has two hand grips each of which is in the form of a U-shape having two substantially parallel end portions. A pin extends between the end portions and is detachably connected to the latter. A variable number of elastic closed bands or loops enclose each of the pins so as to normally engage the pins of the hand grips when the hand grips are separated from one another by a person performing an exercise. The number of loops or bands, in the form of rubber bands, can be changed by removing the pins from the hand grips and disengaging one or more of the bands. The flexibility in which the exercising apparatus may be utilized is enhanced by securely connecting one of the hand grips to a flat, substantially rigid board. The board may be clamped to a flat supporting surface and cushioning means in the form of a foam pad may be positioned on the flat board when the apparatus is utilized for hand wrestling exercises. Alternately, a person can stand on the board and do back and leg exercises.

3,815,905

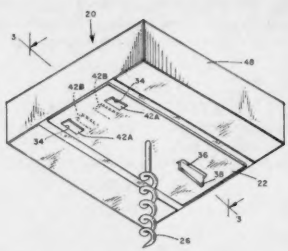
BASEBALL BASE

David L. Golomb, Port Washington, N.Y., assignor to Everlast World Boxing Headquarters Corp., Bronx, N.Y.

Filed May 19, 1972, Ser. No. 254,987

Int. Cl. A63b *71/00*

U.S. Cl. 273—25 **6 Claims**



A baseball base which comprises first and second interlocking plates, the first, plate is provided with a pair of generally cup shaped shoe members, a blade receiving slot and a ground engaging anchor member. The second plate is provided with a pair of generally L-shaped foot members and a ground penetrating blade member, the second plate also being enclosed by a resilient base padding having the foot and blade members extending through the padding surface. When the base is to be positioned on the ground, the anchor member is positioned in the ground as an anchor for the first base member, the L-shaped foot members and the blade member of the second plate are inserted into the shoe members and blade receiving slot respectively, of the first plate, thus making the base ready for use.

3,815,906

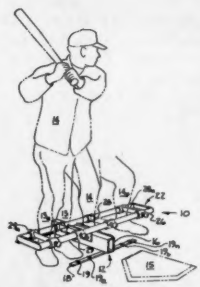
BATTING PRACTICE TRAINER

Lawrence E. Hermo, 5100 S.E. Alderway, Milwaukie, Oreg. 97222

Filed Oct. 4, 1972, Ser. No. 294,871

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 R **4 Claims**

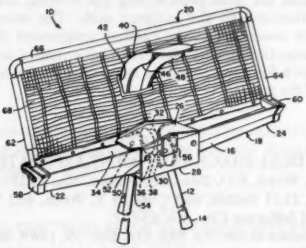


A batting practice training device, for teaching a player proper batting stance and stride technique, includes a laterally extending base and an elevated longitudinally extending rectangular frame mounted for lateral adjustment thereon. A pair of retaining members for controlling the player's stance and stride interconnect the respective longitudinal side portions of the frame member on either side of the base and are adjustable longitudinally in either direction from the base. Auxiliary support means attachable to the base permit the training device to be readily used indoors.

3,815,907
BALL RECEIVING, METERING AND PROJECTING SYSTEM

Jay E. Cook, P.O. Box 87, Cockeysville, Md. 21030

Filed Nov. 17, 1972, Ser. No. 307,611
Int. Cl. A63b 39/00
U.S. Cl. 273—30 11 Claims

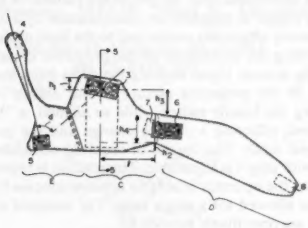


An improved ball receiving and projecting system of the type having a detachable, foldable receiving net, a stand-mounted ball projector, and upwardly foldable trough wings, additional features being a ball-metering unit adapted to receive balls alternately from the trough wings and to meter the balls out to the projector at uniform intervals; an improved trough having co-acting Y- and U-section portions, a unique ball-shed over the central portion of the trough, and simplified articulated structure are also disclosed.

3,815,908
BOWLER'S WRIST SUPPORT

Yoshio Hashimoto, 3-11, 2-chome Sakuragi-cho, Sama-ku, Kobe, Japan

Filed May 29, 1973, Ser. No. 364,921
Int. Cl. A63b 71/14
U.S. Cl. 273—54 B 12 Claims

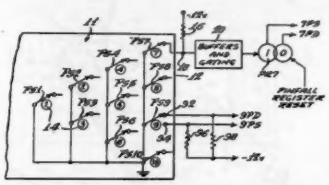


A bowler's wrist support preventing the wrist from bending outwardly when the bowler releases the ball comprising a thumb band portion, a rigid portion and a wrist band portion. The rigid portion has a core comprising an outer rigid member and an inner resilient member. Fastening members are placed so that the support is well positioned over the wrist and the hand irrespective of the size of the hand or thumb while the band portion leaves the palm of the hand free from encumbrances.

3,815,909
SPLIT DETECTION SYSTEM

Jack A. Russell, Muskegon, Mich.; Jerome F. Walker, Kirtland, and James M. Hardenbrook, Columbus, both of Ohio, assignors to Brunswick Corporation, Chicago, Ill.

Filed Jan. 30, 1967, Ser. No. 612,681
Int. Cl. A63d 5/04
U.S. Cl. 273—54 C 12 Claims



A split detecting system for use in bowling comprised of a circuit of electronic logic gates formed of semiconductor elements and connected to determine the truth of the following logical expression:

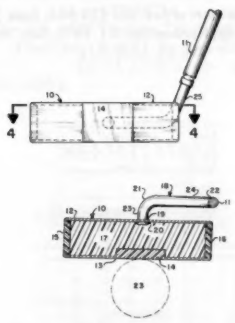
$$S=\overline{1}(10\cdot\overline{6}\cdot 3+\overline{6}\cdot 10\cdot 9+\overline{3}\cdot 5\cdot 10+\overline{3}\cdot 8\cdot 10+2\cdot 10+4\cdot\overline{10}+7\cdot 10+7\cdot\overline{4}\cdot 2+7\cdot\overline{4}\cdot 8+7\cdot\overline{2}\cdot 5+7\cdot\overline{2}\cdot 9+7\cdot\overline{3}+7\cdot 6+8\cdot\overline{5}\cdot 3+8\cdot\overline{5}\cdot 9+4\cdot\overline{2}\cdot 5+4\cdot\overline{2}\cdot 9+4\cdot 3+6\cdot\overline{3}\cdot 5+6\cdot\overline{3}\cdot 8+6\cdot 4+2\cdot\overline{5}\cdot 9+2\cdot 6+2\cdot 3) \quad (1)$$

where:
S represents the presence of a split
1–10 represent standing pins in their conventional positions,
1–10 represent downed pins in their conventional positions,
the symbols ( ) and · represent AND functions, and
the symbol + represents an OR function.

3,815,910
PLASTIC FILLED GOLF PUTTER WITH DOUBLE GOOSENECK SHAFT ATTACHMENT MEMBER

Clifford D. Raines, 4822 Allegheny, San Antonio, Tex. 78229

Filed Jan. 18, 1973, Ser. No. 324,841
Int. Cl. A63b 53/02
U.S. Cl. 273—80 C 4 Claims



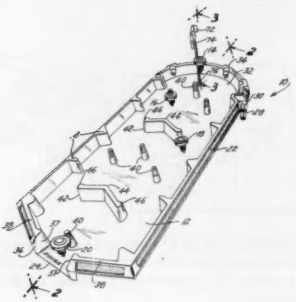
This invention pertains to a new design, configuration, and mode of construction for a golf putter. A putter head is constructed from metallic square tubular stocks. A plastic putting surface is constructed in the face of the club and the tubular body is filled with epoxy or injected plastic. The shaft is secured to the center of the rear of the head. The shaft makes a 90° turn, extends parallel to the head, and projects upward at a 10° angle from the normal.

3,815,911

RACING TOPS

Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed Feb. 3, 1972, Ser. No. 223,141
Int. Cl. A63f 9/14
U.S. Cl. 273—86 C 14 Claims



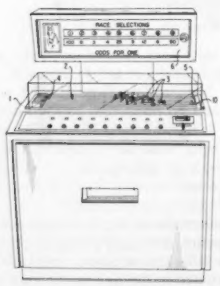
A racing top game is disclosed which includes an inclined playing surface upon which a plurality of spinning tops may be launched, and a peripheral barrier wall extending upwardly from the playing surface to retain the tops on the surface. The barrier wall has a plurality of top launching stations formed therein at the uppermost end of the playing surface and a discharge or "finish line" passage formed at the lowermost end of the playing surface and through which the tops may pass. A plurality of rigid obstacles extend upwardly from the playing surface so that tops launched onto the playing surface from the launching stations are deflected along their paths of travel by the obstacles as they move from the uppermost end of the playing surface towards the lower end thereof to achieve a random discharge of tops from the playing surface through the discharge passage.

3,815,912

RACE GAME WITH PREFERENCE FOR RANDOM WINNER RELATED TO RANDOMLY SELECTED ODDS

Michael Wichinsky, 2611 S. HIghland Ave., Las Vegas, Nev. 89102, and Charles Laughton, 2450 E. 61st S. No., Tulsa, Okla. 74130

Continuation-in-part of Ser. No. 829,984, June 3, 1969, abandoned. This application Dec. 21, 1971, Ser. No. 210,477
Int. Cl. A63f 9/14
U.S. Cl. 273—86 F 10 Claims



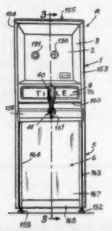
This invention provides a race game apparatus in which racing figures are caused to move along a track from a starting point to a finishing point. In the preferred arrangement the racing figures are model horses ridden by model jockeys and for the start of the race the horses and jockeys are arranged within a replica of a normal starting gate. The apparatus includes an electric motor which is arranged to move the racing figures at random along the track, controlled by an electromechanical mixer device which operates after the end of the race to randomly preselect the winner of the next race. The mixer includes means for assigning odds to each of the horses, and for then preselecting the winner, the selection being influenced by the assigned odds. The mixer includes means for assuring that the random assignment of odds and winner selection occurs after each race, and a unique magnetic clutch for controlling the movement of the rotating elements of the mixer.

3,815,913

DUAL IMAGE ALIGNMENT APPARATUS

Clyde E. Wren, P.O. Box 288, Fulton, Mo. 65251; Julian C. Wren, 2111 Dalton, and Clifford T. Wren, 402 Norris Dr., both of Jefferson City, Mo. 65101

Continuation of Ser. No. 888,416, Dec. 29, 1969, abandoned. This application Jan. 12, 1972, Ser. No. 217,390
Int. Cl. F41j 5/10
U.S. Cl. 273—101.2 15 Claims



There is disclosed a coin energized machine, the operation of which involves the user's skill in achieving progressive rewards. Within an upright cabinet is mounted a slide projector which, when energized, projects images upon a screen observable by an operator, each picture including a target at some point. The projector is in constant random type movement during play. A separate projector bulb is provided for throwing a cross hairs image on the screen for operator controlled movement over the projected picture. A handle with a switch trigger is supplied for manipulation by a user, which is operatively physically connected to the light projector unit for controlling the movement of the projected cross hairs image over the screen. Upon aligning the cross hairs image with the target of the projected picture to the degree required and pressing the handle switch while so aligned, a "bull's eye" is achieved, effecting a picture change and the posting of the achieved score. The degree of required coincidence of cross hairs with target is adjustable. The process is repeated as many times as the operator is able to achieve success for the period of time allowed for a single coin. The essential electrical elements are operatively provided.

3,815,914

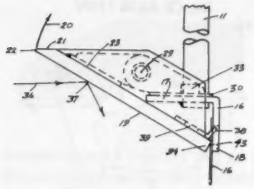
SHOOTING TARGET HOLDER

Joseph Nikoden, Jr., Palatine, Ill., assignor to Detroit Bullet Trap Corp., Schaumberg, Ill.

Filed Dec. 21, 1971, Ser. No. 210,358
Int. Cl. F41j 9/06
U.S. Cl. 273—102 S 2 Claims

A target holder for a shooting range having a spring loaded clip supported on a frame. The clip has a toothed edge for gripping the target and a series of openings in the clip so that

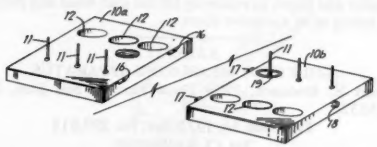
the toothed edge completely punctures the target. The toothed edge is mounted to a deflector plate which is oriented at an angle to the shooter. Because of the toothed arrangement for puncturing the target, momentary deflection of the deflector plate by impact of a bullet from the shooting range will not loosen the target.



3,815,915
RING AND DISC TOSS BOARDS HAVING INTERFITTING HALVES

Branch W. Chapman, Nocona, Tex., assignor to The Raymond Lee Organization, New York, N.Y.; a part interest

Filed Apr. 23, 1973, Ser. No. 353,790
Int. Cl. A63b 21/04
U.S. Cl. 273—104 1 Claim

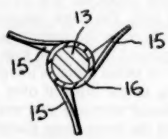


A game in which solid discs and hollow rings are pitched or tossed by competitive players at the recessed holes and at the erect pins respectively of each of the two similar game boards. Each recessed hole and each erect pin is marked with a score value. The two similar game boards fit together for storage purposes, folding about the detachable hinge joint so that the erect pins of one board are located in the opposite recessed holes of the other board in the folded storage mode.

3,815,916
FLETCHING UNIT FOR ARROW

Ronald E. Meszaros, 1512 W. 102nd St., Cleveland, Ohio 44102

Filed Apr. 13, 1970, Ser. No. 27,841
Int. Cl. F41b 5/02
U.S. Cl. 273—106.5 C 9 Claims

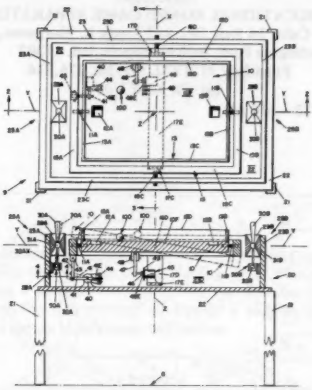


A unitary fletching unit for an arrow utilizing chordally directed vanes integrated with a tubular body which resiliently embraces the shaft of the arrow and on which the vanes describe a helical pattern. The fletching unit is preferably formed of an elastomeric synthetic resin of very thin section or wall thickness so as to provide a fletching unit having a weight not greater than twice the weight of a comparably sized feather fletching.

3,815,917
TILTABLE TABLE APPARATUS FOR BALL ROLLING GAMES

Richard L. Brown, Bellevue, Nebr., assignor to Midway Manufacturing Company, Schiller Park, Ill.

Filed Aug. 4, 1972, Ser. No. 278,114
Int. Cl. A63b 67/14
U.S. Cl. 273—110 11 Claims

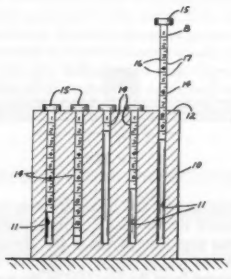


A table as a playing field for a rollable ball which table is tiltable about one or both of a pair of substantially horizontal perpendicular axes, the apparatus being provided with suitable power source means for tilting the table whereby the ball travel relative to a table target is independent of a contestant's physical strength, but rather is dependent upon his ability in wielding a manipulator device for the powering means, which device is wielded at a remotely positioned operator's station. The table tilting powering means is preferably throttled whereby the ball is not catapulted from the table but rather remains rollably engaged therealong, the manipulator device motion is desireably directionally correlated with the ball rolling direction likely to result therefrom, and there is the further capability for two competing players at opposed operator stations including therewith apparatus means for resolving individual player efforts to control the ball through the table tilting powering means.

3,815,918
BOX AND VARIOUS LENGTH RODS HAVING LENGTH INDICIA

Ralph F. Norvitch, 1787 Taconite Trl., Eagan, Minn. 55122

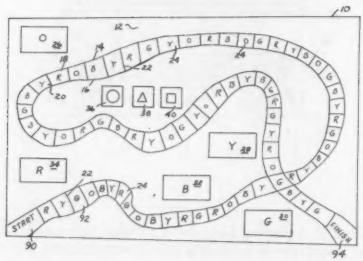
Filed Oct. 19, 1973, Ser. No. 408,069
Int. Cl. A63b 71/06
U.S. Cl. 273—130 R 1 Claim



A game comprising a box-like housing having a substantial amount of interior open area opening through a plurality of

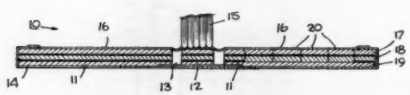
equal sized apertures in a wall thereof and a plurality of rods of identical cross sectional shape projecting one through each aperture from the outside of the housing into the open area, the rods having identical heads mounted on their outer ends but being of various lengths and each having length indicating indicia spaced therealong.

3,815,919
EDUCATIONAL BOARD GAME APPARATUS
Diana K. Cain, 16 East Dr., and Linda L. Morgason, 14 East Dr., Burlington Park, both of Muncie, Ind. 47302
Filed July 31, 1972, Ser. No. 276,316
Int. Cl. A63f 3/00
U.S. Cl. 273—134 AD 9 Claims



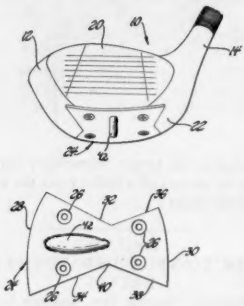
A game device comprising a game board having first indicia defining a pathway and second indicia dividing the pathway into a multiplicity of adjoining segments. Also provided are a plurality of decks of cards, each of the cards having thereon a problem situation and a plurality of alternative solutions to the problem. Also provided is a chart having indicia and a second plurality of decks of cards associated therewith for determining the amount and direction of movement of playing pieces on the pathway. A plurality of indicia are provided for associating each of the segments with the first mentioned plurality of decks of cards and for associating the alternative solutions with movement instructions.

3,815,920
PUZZLE AND BOOK STRUCTURE
Leewood C. Carter, Warren Township, and Edward K. Mullen, Westfield, both of N.J., assignors to Book Covers, Inc., Newark, N.J.
Filed Mar. 28, 1969, Ser. No. 811,487
Int. Cl. A63f 9/10
U.S. Cl. 273—157 R 7 Claims



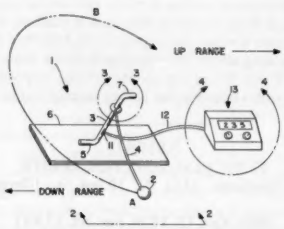
A combination puzzle and book structure wherein a multilayered leaf board thereof has a partial unadhered common surface between two of its layers in the central region of the leaf board. An end leaf is adhered to the top layer of the leaf board. Cuts extend from the end leaf to the partial unadhered common surface to form puzzle pieces. The end leaf and the leaf board are individually hinged to a spine board and a book is adhered to the spine board.

3,815,921
GOLF CLUB SOLE PLATE
William M. Turner, Royal Oak, Mich., assignor to Golf Products, Inc., Milford, Mich.
Filed Mar. 13, 1972, Ser. No. 234,131
Int. Cl. A63b 53/04
U.S. Cl. 273—174 2 Claims



A sole plate for golf club woods and which is flush fitted to the underside of the club head, includes a wedge-locking and locating shape, and is formed to provide a protrusion which extends therebeneath and forms an obstruction of increasing breadth and depth to relatively lift the club head and preclude the taking of an excessive divot.

3,815,922
GOLF SHOT MEASURING APPARATUS
Robert E. Brainard, 1970 Plaza Montez, San Jose, Calif. 95132
Filed Oct. 16, 1972, Ser. No. 297,611
Int. Cl. A63b 69/36
U.S. Cl. 273—184 B 17 Claims

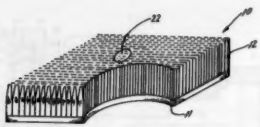


A simulated golf ball target is tethered to a generally vertically directed post. The golf ball target is struck by a normal golf stroke and the impacted ball swings in a circular arc around the tether post. The down range component of deflection or strain produced by the centrifugal force vector on the tether post is monitored as by strain gage or other sensor. The sensed deflection or strain signal is integrated to yield an output corresponding to the integral over 180° of arc. The integral is proportional to range and may be displayed on a readout to indicate the down range distance of the golf shot.

3,815,923
GOLF SWING ANALYSIS MAT
Thomas G. Goduto, 2116 Victoria Ave., Bellevue, Nebr. 68005
Filed Dec. 26, 1972, Ser. No. 318,392
Int. Cl. A63b 69/36
U.S. Cl. 273—186 R 10 Claims

A golf swing analysis mat having bicolored pliable fibers secured to a backing, wherein the fibers are combed to a

uniform inclined position and upon being struck by the head of a golf club will be moved to a second position thus disclosing the direction of swing of the golf club. Each fiber com-



prises two sections secured together and to the backing by heat fusion thus providing an extremely durable and effective mat.

3,815,924

SOUND REPRODUCING APPARATUS

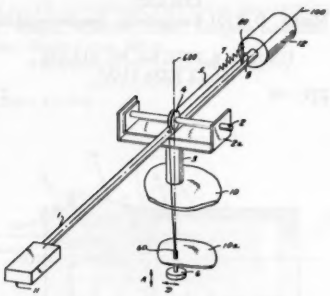
Wolfgang Hasselbach, Konigstein, Germany, assignor to Braun AG, Frankfurt, Germany

Continuation of Ser. No. 825,184, May 16, 1969, abandoned. This application June 24, 1971, Ser. No. 156,568

Claims priority, application Germany, May 18, 1968, 1772463

Int. Cl. G11b *3/28*

U.S. Cl. 274—23 R **8 Claims**



A record player wherein the pressure between the needle of the tone arm and a record is adjustable by changing the bias of a biasing device which includes a cord connected to a helical spring. The tone arm is mounted on a horizontal shaft which is rotatably supported by a vertical shaft so that the tone arm can turn with either shaft. One end of the biasing device is connected to the tone arm and its other end is directly or indirectly connected with a support of the record player. An intermediate part of the cord is trained over a pulley which is mounted on the horizontal shaft or on the support; in the first instance, the bias of the biasing device is adjusted by changing the position of the other end with reference to the support. In the second instance, the bias of the biasing device is adjusted by changing the position of the pulley with reference to the support and/or by changing the position of the other end relative to the support.

3,815,925

STUFFING BOX ASSEMBLY

Roland W. Mattoon, P.O. Box 1302, Drayton Valley, Alberta, Canada

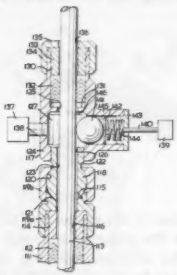
Filed Dec. 12, 1972, Ser. No. 314,318

Claims priority, application Canada, Dec. 20, 1971, 130528

Int. Cl. F16j *15/26;* **F16k** *17/14*

U.S. Cl. 277—2 **8 Claims**

A stuffing box assembly includes tubular means surrounding a pump piston rod and including a pair of longitudinally spaced stuffing boxes. The tubular means is formed as a pair of longitudinal portions having mutually engaging curved surfaces to provide a pivotal connection therebetween. Each portion includes a respective one of the stuffing boxes, and one of



the portions forms a chamber surrounding the rod to receive fluid leaking through one of the stuffing boxes, this one portion having a passage communicating the chamber with the exterior of the one portion to enable a suitable pressure responsive means to be connected thereto.

3,815,926

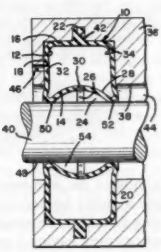
LOW FRICTION SEALING MEANS

Herbert G. Vore, Nashua, N.H., assignor to Improved Machinery Inc., Nashua, N.H.

Continuation of Ser. No. 137,873, April 27, 1971, abandoned. This application May 14, 1973, Ser. No. 360,298

Int. Cl. F16j *9/00, 15/46*

U.S. Cl. 277—34 **17 Claims**



Sealing means comprising a hollow seal containing a chamber and having a wall including a plurality of openings which are either formed completely through the wall thickness or only partially through the wall thickness in communication with one or more grooves in the outer face of the wall. In operation, pressurized fluid at a pressure greater than that of the fluid being sealed is normally continuously supplied to the seal chamber whereby the supplied fluid flows through the openings and intermediate the wall outer face and a thereadjacent element.

3,815,927

GASKET STRUCTURE AND METHOD OF MANUFACTURE

Stanley W. Geipel, Bedminster, N.J., assignor to Metallo Gasket Co., New Brunswick, N.J.

Filed Nov. 24, 1972, Ser. No. 309,133

Int. Cl. F16j *15/00*

U.S. Cl. 277—180 **9 Claims**

A centering device for a spiral-wound gasket, comprising a thin, flat metal plate having an aperture for receiving the

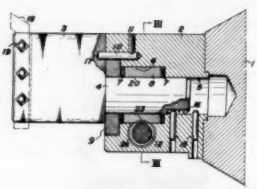
gasket, wherein an aperture-surrounding edge portion of the plate is bent to form a continuous grooved lip, projecting on each side of the plate, for securely holding a circumferential bead on the gasket with opposite faces of the gasket disposed in planes respectively spaced from opposite sides of the plate. A solid metal O-ring may be mounted in the plate, in spaced

concentric relation to the gasket, for limiting compression of the gasket when the gasket is clamped, e.g., between facing pipe flanges. An annular retaining ring carrying another similar O-ring may be mounted within the inner periphery of the gasket. To assemble the device with a gasket, the lip is first formed by bending operations; the gasket is then inserted, and the lip is clamped around the gasket bead.

3,815,928
QUICK-CHANGE TOOLHOLDER FOR NON-REVOLVABLE TOOLS

Hideo Komori, Futtsu, Japan, assignor to Kuroda Seik Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1973, Ser. No. 351,789
Claims priority, application Japan, Apr. 17, 1972, 47-44328
Int. Cl. B23b *29/00, 31/10*
U.S. Cl. 279—1 B **10 Claims**



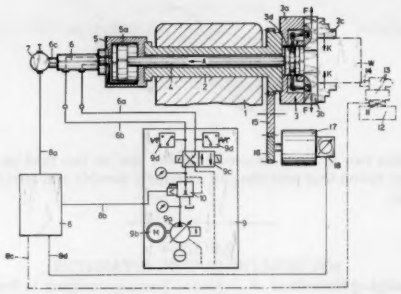
A quick-change toolholder for non-revolvable tools comprise a basic holder and a cutter holder with the basic holder including an annular ring fitted into an annular recess. The annular ring has an inner opening having a center eccentrically displaced relative to the center of its outer periphery. The outer peripheral edge of the annular ring has formed thereon, at least in part, worm threads, and an adjusting shaft is provided with threads meshing with said worm threads. A rotatable means is manually operable at an outer end of the adjusting shaft, wherein said non-revolvable tools are replaceable with alternate tools by revolving the rotatable means simply without need of removing the basic holder from a tool rest at each time of replacement of the non-revolvable tools.

3,815,929
POWER OPERABLE CHUCK

Josef Steinberger, and Heinz Pohl, both of Dusseldorf, Germany, assignors to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed Oct. 12, 1972, Ser. No. 296,936
Claims priority, application Germany, Oct. 13, 1971, 2150885
Int. Cl. B23b *31/30*
U.S. Cl. 279—4 **6 Claims**

A power operable chuck for turning machines with a pressure fluid operable cylinder piston assembly operatively connected to and rotatable with the chuck for acting upon the clamping jaws of the chuck, the chucking force exerted by the cylinder piston assembly upon the clamping jaws being auto-

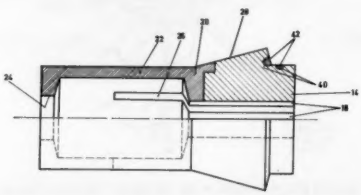


matically variable in conformity with exterior forces, e.g., the centrifugal force or the force exerted upon the cutting tool in the chuck, by correspondingly varying the fluid pressure in the fluid pressure operable cylinder piston assembly.

3,815,930
COLLET

Lorenz Mattes, D 7201-Konigsheim, Bundesrepublik, Germany

Filed Dec. 6, 1972, Ser. No. 312,494
Int. Cl. B23b *31/20*
U.S. Cl. 279—50 **7 Claims**



A collet for the spindle of an automatic lathe or the like, including a plurality of clamping jaws having a least portions thereof supported by and embedded in an elastic member. The elastic member has slots formed therein intermediate adjacent pairs of the clamping jaws so as to provide spring-like biasing action improving the degree of elasticity of the clamping jaws.

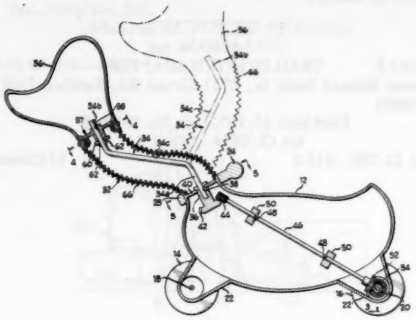
3,815,931
ANIMATED RIDING TOY

Howard J. Morrison, Deerfield, and Marvin I. Glass, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 31, 1973, Ser. No. 328,314
Int. Cl. A63g *19/00*
U.S. Cl. 280—1.201 **5 Claims**

A riding toy having the shape of an animal, or the like, with a plurality of wheels movable over a substructure such as a floor. An elongated neck portion protrudes forwardly from a body portion of the toy and has a head on the outer end thereof. The neck is movable angularly relative to the body portion to rotate the head in a circle spaced from the body portion as the toy moves over a floor, by means of a bent rod member operatively associated with at least one of the wheels for rotation of the rod member relative to the body portion. A

tubular-shaped accordian-type flexible outer sheath is non-rotatably connected to the body portion and the head portion and surrounds the rotatable rod member providing a universal



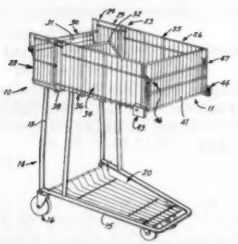
type covering therefor to accommodate movement thereof while maintaining the head oriented in a generally forwardly facing disposition.

3,815,932

FRONT GATE CONSTRUCTION FOR SHOPPING CART

Verlyn C. Ruger, Bellevue, Mich., assignor to Roblin Industries, Inc., Battle Creek, Mich.

Filed June 1, 1972, Ser. No. 258,606
Int. Cl. B62b *11/00*
U.S. Cl. 280—33.99 F **13 Claims**



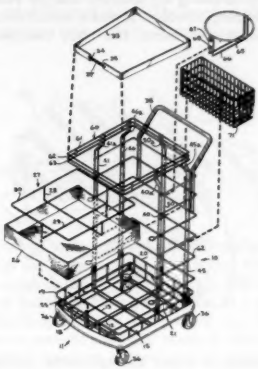
A gate construction for a shopping cart receptacle. The gate construction includes a gate panel disposed between sidewalls of the receptacle for closing an end of the receptacle. The gate panel is supported adjacent its lower edge near the bottom wall of the basket for pivotal and generally upward sliding movement. A latch member is fixed to and extends along the edge of the gate panel and is offset toward the interior of the receptacle. The receptacle sidewall has a further latch member offset interiorly of the receptacle adjacent the gate panel and which includes an ear which coacts with an opening in the gate panel for preventing outward movement of the receptacle sidewalls, so as to prevent inadvertent unlocking of the gate. The gate latch member and sidewall latch member have oppositely oriented substantially L-shaped portions which normally overlap to prevent opening of the gate and to vertically support the gate panel. Such L-shaped portions are disengaged by raising the gate panel, whereafter the gate panel is free to pivot forwardly about its lower edge for opening the end of the receptacle.

3,815,933

UTILITY CART

Victor F. Olson, 6158 Ella Lee Ln., Houston, Tex. 77027

Filed Mar. 26, 1973, Ser. No. 344,496
Int. Cl. B62b *3/04*
U.S. Cl. 280—47.35 **4 Claims**



A utility cart includes a generally rectangular shaped base member having a bottom with front, back and two sides extending upwardly therefrom. First vertically extending members are secured to the two sides in opposed relation at approximately the midpoint thereof with second vertically extending members secured to the sides in spaced relation to the first vertically extending members and extend upwardly in parallel relation thereto adjacent the corners of said base member. Third vertically extending members are secured to the back side of the base member and extend upwardly and parallel between the second vertically extending member. A generally rectangular shaped top member is secured to and extends between the third and second vertically extending member and is also secured to the first vertically extending member and extends forwardly therefrom to overlie the base member of the utility cart. Bag means having an open end and a closed bottom is positioned on the cart with the bottom of the bag resting on the base member and the open upper end of the bag being adjacent the top member and engaged therewith by resilient band means. The top member, first vertically extending members and the base member form an opening at the front and sides of the cart which is generally U-shaped so that the bag upon disengagement with the top member may be removed from the front of the cart.

3,815,934

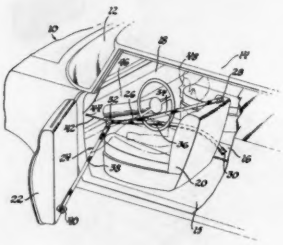
VEHICLE PASSIVE OCCUPANT RESTRAINING BELT ARRANGEMENT

Willem J. J. Weststrate, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 174,664, Aug. 25, 1971, abandoned, and a continuation-in-part of Ser. No. 118,607, Feb. 25, 1971, abandoned. This application Sept. 11, 1972, Ser. No. 288,158
Int. Cl. B60n *2/02*
U.S. Cl. 280—150 SB **3 Claims**

A vehicle passive occupant restraining belt arrangement includes a first belt having one end fixed to an upper inboard portion of a vehicle seat and the other end fixed adjacent a lower inboard portion of the seat, an apertured member slidably receiving the first belt to define shoulder and lap belt portions, a second belt having one end secured to the apertured member and the other end received by a conventional inertia retractor mounted on the lower rear portion of a vehicle door, and a flexible cable having one end secured to the

apertured member and the other end received by a vehicle body mounted retractor positioned adjacent the outboard forward portion of the vehicle body occupant compartment and responsive to door movement. When the door is in closed position, the cable is protracted from the body mounted retractor and the second belt is retracted within the inertia retractor to position the apertured member in a lower rearward position positioning the shoulder and lap belt portions in occupant restraining positions across a seated occupant. During door opening movement, the body mounted retractor



retracts the cable to move the apertured member longitudinally of the vehicle body to an upper forward position as the inertia retractor allows protracting movement of the second belt and movement of the shoulder and lap belt portions to easy-enter positions. During closing movement of the door, the body mounted retractor allows protracting movement of the cable as the inertia retractor retracts the second belt moving the apertured member to the lower rearward position and the shoulder and lap belt portions to the occupant restraining positions.

3,815,935

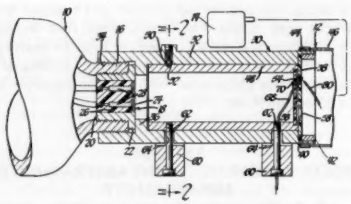
OCCUPANT RESTRAINT SYSTEM

Trevor O. Jones, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1972, Ser. No. 283,825

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **5 Claims**



An occupant restraint system for a vehicle includes an inflator having an outlet sealed by a rupturable diaphragm and providing a source of pressure fluid. The diaphragm is ruptured by electrically fired detonators. A valve arrangement controlling communication of the outlet with an inflatable occupant restraint system includes a stationary outer cylindrical member and a rotatable inner cylindrical member. The inner and outer members have juxtaposed radial end walls. The wall of the outer member includes a circular opening while that of the inner member includes a generally teardrop shaped opening whose center line is generated about the axis of the members. Normally the openings are misaligned. A contact on the wall of the inner member and on the wall of the outer member provide a switch. Pendulous masses on the inner member function to rotate this member relative to the outer member to actuate the switch when the openings are moved to a position of alignment providing an orifice of at least a predetermined minimum area. The switch is included in the actuating circuit for the detonators.

3,815,936

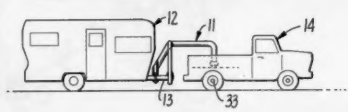
TRAILER HITCH ADAPTER

Grover Edward Oaks, Jr., 2741 Girvan Rd., Redding, Calif. 96001

Filed Sept. 25, 1972, Ser. No. 291,648

Int. Cl. B62d *53/06, 1/14*

U.S. Cl. 280—415 A **15 Claims**



A trailer hitch adapter for housetrailers and the like, to couple the trailer to a towing vehicle at a point immediately above the rear axle of the towing vehicle, having a boom in an inverted U-shape connectable at its forward end to a removable hitch ball mounted over the rear axle, and rigidly and removeably connected at its rearward end to the standard hitch of the trailer and to two other points on the tongue of the trailer. The connection to the standard hitch of the trailer is through a hitch ball carried on a bracket depending from the boom. In one modification shown, the length of that bracket is adjustable. The connection of the forward end of the boom to the hitch ball over the rear axle is made through a forward-opening hitch carried on the lower end of the forward portion of the boom. An alternate embodiment is shown having a lockable second pivot point on the boom approximately above the standard hitch of the trailer, and a restrainer to stop motion about the rear axle pivot when desired.

3,815,937

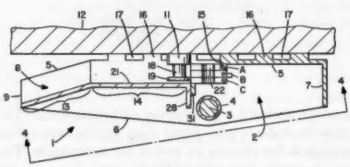
FIFTH WHEEL HAVING A UNIVERSAL KING PIN LOCKING MECHANISM

Donald W. Hodgson, 1646 10th St., Arcata, Calif. 95521

Filed Nov. 9, 1972, Ser. No. 305,161

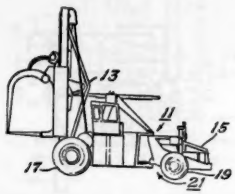
Int. Cl. B62d *53/12*

U.S. Cl. 280—434 **9 Claims**



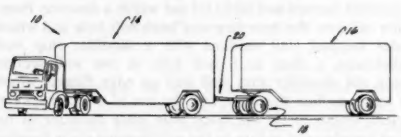
The bottom half of a fifth wheel includes a horizontally movable locking structure for capturing the neck of the king pin to the bottom half. The king pin locking mechanism is universal in that it is capable of providing at least two vertically offset locking collar positions to accommodate at least two different fifth wheel combinations in which the neck portion of the king pin can take at least two vertically offset positions depending upon whether or not the top half includes concentric lands and grooves for mating with similar lands and grooves on the bottom half. A secondary locking means is provided for locking the first locking means in position. Indicator means are provided for indicating to the operator, in the cab of the tractor, a locked condition of the king pin of the fifth wheel.

3,815,938
ADJUSTABLE BALL PIN PIVOT
Lloyd A. Molby, Longview, Tex., assignor to R. G. LeTourneau Inc., Longview, Tex.
Filed July 13, 1970, Ser. No. 54,396
Int. Cl. B62d *53/02*
U.S. Cl. 280—461 R **6 Claims**



A pivot connection for effecting axial alignment adjustment for the ball portion of a ball and socket pivot both to facilitate initial installation and to compensate for wear, characterized by a ball pin having a collet base portion including a bolt ring, a cylindrical shank, and a ball affixed at the other end thereof; a bore disposed in the part to which the ball pin is to be affixed, with a bolt ring surrounding the bore and mating with the bolt ring of the collet base portion; bolts for affixing the collet base portion to the bolt ring surrounding the bore; and a plurality of shims interposed between the bolt rings. A spherical socket for removably receiving said ball portion is characterized by a base portion that is permanently affixed to a second member; a cap portion that is removably affixed to the base portion; and a plurality of shims adapted to be interposed intermediate said cap portion and said base portion for adjusting bearing clearance initially and for compensating for wear. Also disclosed are specific embodiments in which the base portion has a hemispherically shaped, replaceable liner; and a bearing retainer is also disposed intermediate said cap portion and said base portion of the socket.

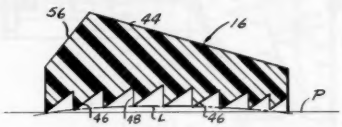
3,815,939
HITCH POSITIONER
Carol J. Pettay, 300 W. 16th St., Hutchinson, Kans. 67501
Filed Aug. 21, 1972, Ser. No. 282,445
Int. Cl. B62d *53/00*
U.S. Cl. 280—474 **6 Claims**



Linkage connects between a leading trailer of a trailer truck rig having two trailers and a trailer supporting dolly hitched to the rear of the leading trailer. The linkage holds the dolly in a fixed horizontal position relative to the leading trailer. Two joined links connect between the rear of the leading trailer and the hitch end of the dolly.

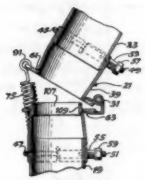
3,815,940
JOINT FOR SMOOTH END OR FLARELESS PIPE
Lawrence F. Luckenbill, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.
Continuation-in-part of Ser. No. 165,292, July 22, 1971, abandoned. This application May 1, 1972, Ser. No. 249,095
Int. Cl. F16l *17/00*
U.S. Cl. 285—105 **19 Claims**

A joint for connecting a smooth wall pipe or tube to fittings or other pipes, the joint including a hollow body member having a passageway therethrough, a split gripper ring positioned and moveable axially within the passageway, and an annular sealing ring member also positioned and moveable axially within the passageway and functioning substantially independently of the gripper ring to provide a seal for a range of pressures within the pipe from zero pressure upwardly to and above pressures of intended use. The internal configuration of teeth of the gripper ring and the external configuration of the



gripper ring cooperating with the internal configuration of the passageway in the body member is such that the pipe can be installed by a stab or thrust of the same into the body member against a stop but when the pipe is pulled in a direction outwardly of the body member, the gripper ring is actuated to grip the pipe to prevent complete removal. The annular sealing ring member functions immediately upon insertion of the pipe into the body member to provide a seal between the pipe and the body member.

3,815,941
YIELDABLE CONNECTOR FOR EXHAUST PIPE SECTIONS
Kenneth F. Snyder, 2844 E. Pleasant, Eden, N.Y. 14057
Filed June 5, 1972, Ser. No. 259,428
Int. Cl. F16l *27/00*
U.S. Cl. 285—283 **10 Claims**

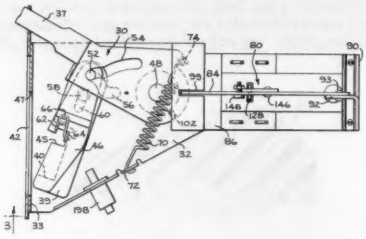


A yieldable two-section connector for vertical sections of motor truck engine exhaust piping includes a pair of matching flanges which are adapted to be joined to separate exhaust pipe sections, a hinge joined to the flanges, and offset springs connecting one such flange of one connector section to clamp means held in desired position on the other section, to hold the connector sections and the pipe firmly in place with the flange surfaces in contact.

3,815,942
THERMALLY RESPONSIVE LOCKING MEANS FOR OVEN DOOR LATCHING MECHANISM
James A. White, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed July 31, 1972, Ser. No. 276,811
Int. Cl. E05c *5/00*
U.S. Cl. 292—113 **3 Claims**

A sliding latch mechanism for the door of the heated cavity such as an oven door. The latch mechanism includes a latch handle and a pivoted latching bolt for swinging out and engaging the door. There is a thermally responsive locking means for locking the door latching mechanism in its closed position.

The locking means comprises a single point snap-acting thermostat and a movable pawl whereby at a sensed temperature of about 600°F. the thermostat will cause the shifting of the



pawl for cooperation with the latch mechanism. The thermostat includes switch means for both the power and control circuits for the heating means of the oven.

3,815,943

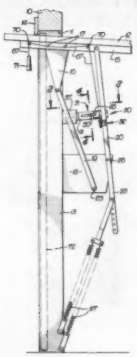
OVERHEAD GARAGE DOOR LATCH

Robert W. Hass, 27176 Cole Place, Highland, Calif. 92346

Filed Apr. 13, 1973, Ser. No. 350,929

Int. Cl. E05c *17/00*

U.S. Cl. 292—254 **5 Claims**



A heavy angle bracket mounted high on a garage door post has adjustably fixed thereto an approximately horizontal arm bearing a spring biased latch positioned in confronting relation with one of two links connecting a door post mounted plate with the door side edge thereabove.

A spring retracted latch release rocker is affixed to said link and has a string leading to a mid point in the door from which it can be siezed manually to release said latch whereby said door may be swung downwardly and closed.

3,815,944

ROLLER CAM LATCH FOR WINDOW

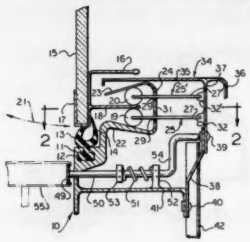
Robert A. Noga, Del Mar, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 4, 1972, Ser. No. 294,960

Int. Cl. E05c *17/10*

U.S. Cl. 292—261 **6 Claims**

A latching flange extending laterally inwardly along the lower edge of a hinge-suspended window is positioned to enter between a pair of cam actuated latch rollers which are journaled on laterally outwardly spring biased members to ride between a pair of laterally outwardly converging cam surfaces. The cam pressed rollers grip the flange when introduced therebetween and prevent its withdrawl, thereby holding the window closed. Manually drawing the spring biased members



and its rollers inwardly frees the rollers from the cams and permits the flange to be withdrawn and window to be opened. For releasing the flange from the exterior of the vehicle for automatic window washing a spring biased rail is provided exteriorly of the vehicle, and a roller, rolling along this rail, moves the rollers inwardly to flange releasing position.

3,815,945

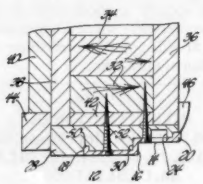
DOOR FRAME SECURITY PLATE

Eugene R. Lamphere, 1770 Revere, Pontiac, Mich. 48054

Filed Aug. 31, 1972, Ser. No. 285,185

Int. Cl. E05c *19/00*

U.S. Cl. 292—340 **4 Claims**



A member formed and fitted for use within a doorway framing side rail over the door stop and latch bolt hole and which includes stepped wall sections with a shoulder stop wall therebetween, a door latch bolt hole in one wall section between the shoulder stop wall and an edge flange, which serve to strengthen this area, and the use of wood screws of sufficient length to tie the latch hole plate member to the framing member and in turn to the wall framing studs therebehind.

3,815,946

ENERGY-ABSORBING BUMPER BAR ARRANGEMENT FOR MOTOR VEHICLES

Karl Jullig, Walldorf, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed May 14, 1973, Ser. No. 359,716

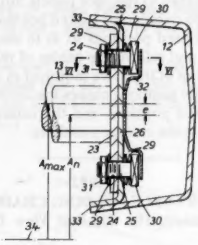
Claims priority, application Germany, May 27, 1972, 2225880

Int. Cl. B60r *19/08*

U.S. Cl. 293—99 **9 Claims**

A resilient connection for attaching one end of a frame mounted energy absorbing support unit telescopeable longitudinally to a transverse and vertically oriented channel section of a collision bumper assembly, the connection including a plate rigidly disposed on the end of the energy absorbing unit

and defining a transverse surface flanked by a pair of beveled surfaces, registered mounting apertures in the plate transverse surface and in the channel section for receiving therethrough attaching bolts and spring washers disposed between one surface of the channel section and a head on each bolt and



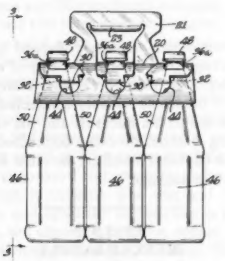
between one surface of the plate and a nut disposed on each bolt. The mounting apertures are situated vertically eccentric with respect to the longitudinal axis of the support unit so that the height of the attached bumper above the pavement can be altered by inverting the support unit.

3,815,947

BOTTLE CARRIER

Robert C. Olsen, Wheeling, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Nov. 13, 1972, Ser. No. 305,728
Int. Cl. B65d *71/00*
U.S. Cl. 294—87.2 **5 Claims**



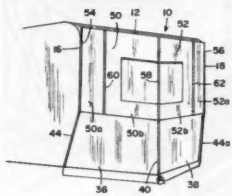
The embodiment of the invention disclosed herein is directed to a carrier for a plurality of bottles arranged in a row. The carrier is made from a resilient deformable plastic sheet material which folds and mechanically locks into a prism-like shape in which the end faces are triangles. Aligned apertures through the base and apex of the carrier provide an interlocking relationship of the carrier with the bottles such that the side walls of the carrier are bowed outwardly to project the marginal edges of the apertures in the apex of the carrier firmly against the underside of the cap portion enlargements of the bottles with the marginal edges of the apertures in the base of the carrier being firmly circumferentially urged downwardly against the enlarging neck portions of the bottle. The bottle gripping apertures in the apex of the carrier are defined by partially lapped larger apertures in lapped sections of the carrier. Simple tabs permit the carrier to be unlocked and the larger apertures in lapped sections of the carrier may then be axially aligned to permit the carrier to be easily lifted from the bottles. The carrier may be reused by mechanically interlocking the tabs in the tab receiving apertures and projecting the carrier downwardly over the bottles until the apex apertures snap below the enlarged cap portions of the bottles. An integral upwardly extending handle is provided for easy carrying of the bottles inserted into the carrier.

3,815,948

DEFLECTOR WALL

Thomas E. Alford, Det. 3, 7122nd Bcstg. Sq. CMR Box 418, APO New York, N.Y. 09009

Filed Nov. 24, 1972, Ser. No. 309,615
Int. Cl. B60j *9/04*
U.S. Cl. 296—1 S **15 Claims**



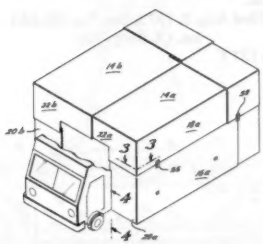
When towing a travel trailer, recreational vehicle or motor home, complex wind disturbances are created immediately in front of the trailer. These wind disturbances often induce instability in the trailer which is transmitted to the towing vehicle thereby making handling of the rig difficult and sometimes dangerous. To minimize the instability in trailer towing due to wind disturbances at the front thereof, a removable deflector wall extends to form a wedged shaped wind deflector to streamline the movement of air around and past the front of a towed trailer. This deflector wall includes two panels one hingedly mounted to each of the opposite leading vertical corners of the trailer. The panels are stored when not in use against the trailer sides or track pairs. In one configuration of the deflector wall, an upper and lower section is employed.

3,815,949

EXPANSIBLE MOBILE HOME

Izaak A. Ulert, 3651 Dumbarton, Houston, Tex. 77025

Filed June 11, 1973, Ser. No. 368,959
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 C **4 Claims**



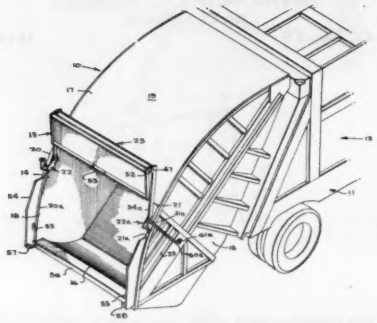
An expansible and contractible mobile home, camper or trailer for personal or commercial use has interfitting floor, roof and wall sections, and additional interfitting end floor, roof and wall sections, which move relatively to one another so that it is expansible and contractible in three directions, that is, height, width and length, thereby making it compact and readily transportable yet expandable into a relatively spacious and commodious mobile home, camper or trailer. Means are provided for guidedly moving the sections into expanded and contracted positions, and for releasably securing or clamping the sections in contracted and expanded position.

3,815,950

DOOR ASSEMBLY FOR A REFUSE RECEIVING HOPPER

Roland W. McKenzie, R.F.D. Rt. 3, Box 67X, and Richard Stansberry, 1114 Farley St., both of Culpepper, Va. 22701

Filed June 18, 1973, Ser. No. 370,607
Int. Cl. B62d 33/04
U.S. Cl. 296—56 12 Claims



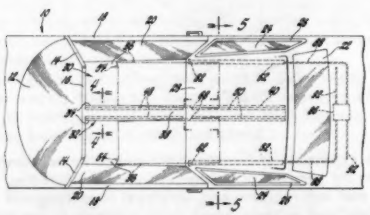
A door assembly for a refuse receiving hopper of a refuse vehicle, generally including a pair of arm assemblies pivotally mounted on the rear ends of the hopper side walls, a door panel secured to the arm assemblies, a pair of springs interconnecting the arm assemblies and the hopper side walls and means mounted on the hopper engageable by the arm assemblies for restricting the pivotal movement of the arm assemblies within an arc intersected by a plane passing through the connections of the spring members with the hopper side walls and the pivot axis of the arm assemblies whereby upon manipulation of the door panel in moving the arm assemblies above and below the arc intersecting plane, the springs will operate to bias the door panel in an open position disposed above the hopper opening and to a closed position disposed across the hopper opening, respectively.

3,815,951

VEHICLE BODY RETRACTABLE TOP

Wayne E. Nantau, Fraser, and Samuel C. Pollock, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1973, Ser. No. 386,604
Int. Cl. B60j 7/00
U.S. Cl. 296—137 F 4 Claims



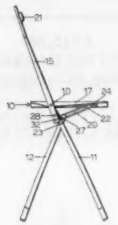
A vehicle body retractable top including a pair of roof panels movable in a generally translatory manner between raised positions closing forward passenger and driver roof openings and rearward storage positions below a fixed rear roof portion to the rear of these openings. The rear ends of the roof panels are slidably supported by elongated inboard and outboard guides whose forward ends have arcuately curved configurations oriented so as to move the rear ends of the panels downwardly and inwardly as the panels move rearwardly from the raised position in a manner that prevents interference between the panels and the rear roof portion. A pair of drive cables driven by an electric drive motor are respectively connected to the roof panels through overcenter links that move into overcenter locked positions as the panels are driven to the raised positions so as to thereby secure the panels in position and relieve the cables of their normal driving forces. Actuation of the drive motor so as to drive the roof panels to the storage positions causes the drive cables to move the links to released positions and thereafter drive the roof panels rearwardly to the storage positions.

3,815,952

PORTABLE FOLDING CHAIR

Lawrence D. Minsker, 102 Pleasant View Dr., Jamestown, N.Y. 14701

Continuation-in-part of Ser. No. 75,527, Sept. 25, 1970, abandoned. This application July 11, 1972, Ser. No. 270,869
Int. Cl. A47c 4/00
U.S. Cl. 297—47 6 Claims



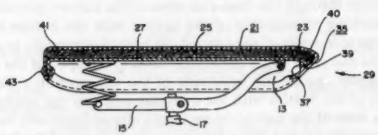
A folding chair which may be collapsed into a compact, rectangular package. The chair is made up of a seat, backrest, legs and a sliding frame member, all articulated in such a way that by means of the frame slidably connected to the seat and pivotally connected to the backrest and the rear leg member and the front leg member pivotally connected to the rear leg member and the backrest member, the chair folds into a compact, relatively thin package.

3,815,953

BICYCLE SADDLE

George W. Worley, Bolivar, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.

Filed Oct. 4, 1972, Ser. No. 294,764
Int. Cl. B62j 1/00
U.S. Cl. 295—297 4 Claims



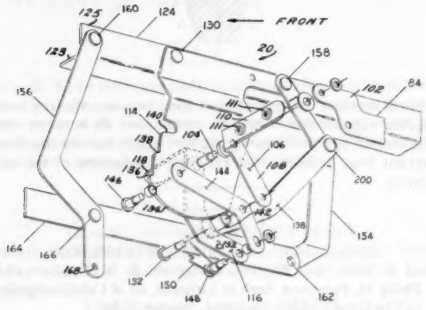
An improvement in bicycle saddles of the type having a supported base which is covered with a plastic cover and has resilient padding inserted between the base and cover. Also, the base is the well known type which has an open nose. The improvement includes tongue and groove interlocking structure for locking the nose of the cover to the nose of the base, i.e., thus obviating the use of any other type fastener. The

resilient pad insert urges the tongue and groove into a positive interlocking arrangement. The rear of the cover is attached to the base in any typical manner.

3,815,954
ROCKER RECLINER CHAIR

W. Clark Rogers, Jr., High Point, and Morton Snitzer, Rocky Mount, both of N.C., assignors to The Lane Company, Inc., Altavista, Va.

Continuation-in-part of Ser. No. 87,280, Nov. 5, 1970. This application Mar. 24, 1971, Ser. No. 127,649
Int. Cl. A47c 3/02; A47d 13/10
U.S. Cl. 297—271 **11 Claims**



The chair back is reclined independently of movement of the footrest which is operated by a handle. Detents associated with the handle mechanism allow the footrest to be extended and retracted into any four positions including fully extended, fully retracted and two intermediate positions. As the back is reclined, the seat and arms, which constitute a unit, are first tilted to a predetermined "bucketing" angle by the locking mechanism, forward rocking is inhibited then rearward rocking is also prevented by the novel locking mechanism. The locking mechanism mounts on the underside of the cam frame, between the cams and works off a torque tube that moves angularly about its long axis as the footrest is operated and which moves forward and upwardly and rotates angularly as the chair back is reclined. The seat and frame unit also move forwardly and upwardly as the chair is reclined. In the preferred form, the chair is a platform rocker; it may also be mounted on a swivel platform rocker base. The back is provided with tapered sleeves which fit over tapered tongues on the mechanism to allow the chair to be shipped knocked down, and then set-up. The footrest includes two sections which store one behind the other when retracted, then move to coplanar relationship as the footrest is extended to its first position to provide greater extension. The lazy tongs action of the footrest extending and retracting part of the mechanism is skewed to permit exposed front rail and/or high leg styling for the base. The design of the mechanism permits a particularly cushioning seat filling to be used.

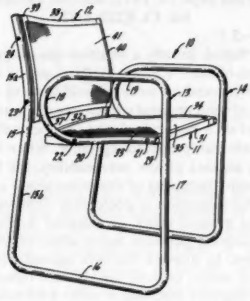
A particular design of rocker-recliner chair locking mechanism is disclosed and claimed in this document.

3,815,955
CHAIR CONSTRUCTION

Charles A. Gibilterra, Sherman Oaks, Calif., assignor to The Vecta Group, Inc., Kalamazoo, Mich.

Filed Dec. 29, 1972, Ser. No. 319,627
Int. Cl. A47c 3/023
U.S. Cl. 297—295 **7 Claims**

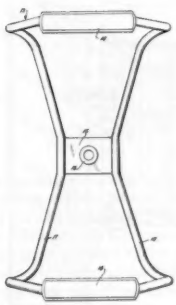
Chair construction having independent back and seat support means, preferably including a pair of substantially identical side frame members of tubular metal or the like having generally U-shaped configuration. The back and the seat are secured to the side frame members, but move independently of each other without the assistance of springs or other tensioning means. One of the upwardly-extending shanks of each U-shaped side frame member terminates in a loop which provides an arm rest, and the bight of each side frame member provides a base means.



3,815,956
ROTARY ARMCHAIR

Karl Bocksch, Arolsen, and Willi Hensel, Willingen, both of Germany, assignors to Mauser Kommanditgesellschaft, Koln, Germany

Filed Jan. 2, 1973, Ser. No. 320,495
Claims priority, application Germany, Jan. 3, 1973, 2200106
U.S. Cl. 297—349 **7 Claims**



A base carries an upright telescopic spring-loaded column the lower end of which is removably received in a conical seat of the base, and the upper end of which is also provided with a conical seat. A discrete arm-rest unit has two symmetrically shaped tubular elements, the outer ends of which are connected by respective armrests, and the center of which is bridged by a connecting plate having a conical opening into which the conical seat at the upper end of the column is insertable so that a portion of the conical seat extends upwardly out of the plate. A seat unit including a seat and the backrest extending upwardly from the seat, is provided at the underside of the seat with a socket into a conical recess of which the upwardly extending part of the conical seat of the upper end of the telescopic column is insertable.

3,815,957
CONTROLLED IN-SITU LEACHING OF MINERAL VALUES

Henry Rush Spedden, and Emil Edward Malouf, both of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

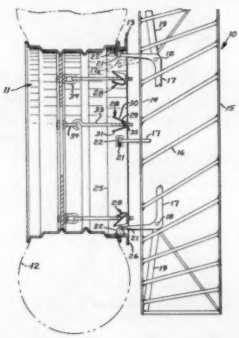
Filed Sept. 11, 1972, Ser. No. 287,658
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 **15 Claims**

A freezing liquid, usually a liquified gas easily vaporized by the absorption of heat, e.g. liquified oxygen or nitrogen, is injected into or around an underground area to be treated for the recovery of solid mineral values, usually a naturally occurring deposit of such mineral values as copper sulfides or oxides or a mine waste dump containing same. When injected under pressure into an area of low permeability, the freezing liquid effects hydraulic fracturing of the mineralized solid materials. Control of the operation is preferably achieved by freezing either natural ground water or injected water in boundary zones, e.g. relatively pervious zones adjacent to relatively impervious zones, to provide barriers against dissipation, into such boundary zones, of both the injected freezing liquid and subsequently injected leaching or other treatment fluid. In the instance of natural ground water at least, air under pressure may be advantageously introduced into the area to be treated immediately prior to the introduction of the freezing liquid. When sulfide minerals are involved, liquid oxygen as the freezing liquid will aid in fracturing the underground formation by reason of volume increase due to chemical reaction with the sulfide.

3,815,958
ASSEMBLY FOR ATTACHING AUXILIARY WHEELS TO A TRACTOR

William J. Dietrich, Sr., R. R. Congerville, Ill., assignor to Dietrich Manufacturing Inc., Goodfield, Ill.

Filed Jan. 18, 1973, Ser. No. 324,871
Int. Cl. B60b *15/00*
U.S. Cl. 301—41 R **4 Claims**



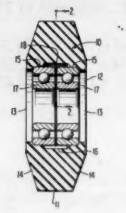
A dual or auxiliary drive wheel with a plurality of expandable arms, each provided with a cleat-engaging lug, removably secured to a detachable rim which contains the cleats for holding it. The rim is fastened to the wheel with bolt fasteners.

3,815,959
INDUSTRIAL ROLLER OR WHEEL

Menno E. Hill, 806 Harbor Island, Clearwater, Fla. 33515

Filed Aug. 8, 1972, Ser. No. 278,746
Int. Cl. B60b *5/02*
U.S. Cl. 301—63 PW **2 Claims**

A roller or wheel particularly adaptable to the elevator and moving stairway industries, as well as other like industrial uses. The roller features an elastomeric tire and a low friction bearing support for the tire constructed and arranged so that the assembly allows the natural movement of the tire material, thus preventing generation of high heat and therefore stands up under long periods of usage and typical industrial loadings.

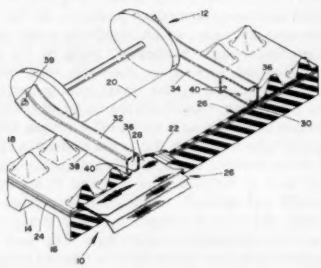


Critical features include a relief zone between the tire and bearing support and a certain interference fit between the elastomeric tire and bearing support which factors coact to prevent heat build-up with resulting destruction of the assembly.

3,815,960
ENDLESS TRACK AND SLIDE THEREFOR

Paul E. Russ, Sr., Englewood; Donald R. McComber, and Philip M. Patterson, both of Littleton, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 9, 1972, Ser. No. 279,163
Int. Cl. B62m *27/02*; **B62d** *55/24*
U.S. Cl. 305—14 **6 Claims**



An integrally molded track having one or more strips of insulating material disposed near at least part of the inner surface of the track. A perforate slide bar containing a heat sensitive lubricant system constantly or intermittently engages supports, and automatically lubricates the track.

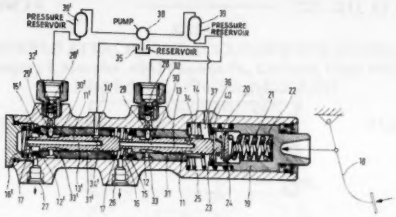
3,815,961
MASTER CYLINDER FOR A TWO-CIRCUIT BRAKE SYSTEM

Juan Belart, Walldorf, and Anton David, Gotzenhain, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 22, 1972, Ser. No. 308,862
Claims priority, application Germany, Dec. 24, 1971, 2164591
Int. Cl. B60t *15/06*
U.S. Cl. 303—52 **16 Claims**

This relates to a master cylinder for a two-circuit brake system having brake pressure medium supplied under pressure to both brake circuits from an associated brake pressure medi-

um reservoir. The master cylinder includes two tandemly related axially displaceable control pistons. Each of these control pistons include an inclined control surface in contact with a push rod for a valve through which the pressurized brake pressure medium to actuate the associated one of the brake



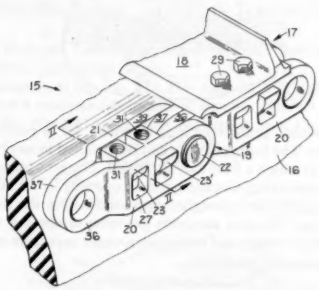
circuits. When the brake pedal is depressed the control pistons move in a manner to enable the inclined control surfaces to open their associated valve and thereby apply pressurized brake pressure medium from the associated one of the reservoirs to the associated one of the brake circuits.

3,815,962

TRACK LINKS FOR CUSHION TRACK

Robert N. Stedman, Chillicothe, and Roger L. Boggs, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 4, 1972, Ser. No. 311,824
Int. Cl. B62d *55/28*; **B60c** *27/20*
U.S. Cl. 305—19 **23 Claims**



A cushion track comprises an annular resilient driver having a track assembly mounted therearound. The track assembly comprises a pair of laterally spaced, articulated link assemblies closely coupling a plurality of ground-engaging track shoes together. Each link assembly comprises first and second parallel link members having retaining means extending transversely therefrom and releasably connected to each track shoe by at least one bolt. The retaining means comprises a flange integrally formed on each link member or a separate T-shaped member disposed between the link members.

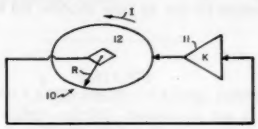
3,815,963

PSEUDO-DIAMAGNETIC SUSPENSION AND PSEUDO-DIADIELECTRONIC SUSPENSION

Leonard S. Wilk, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 17, 1972, Ser. No. 272,601
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **15 Claims**

A system for levitating or suspending an object through the use of magnetic or electric fields wherein a primary magnetic field, for example, is established in an operating region so as to have its energy density divergence oriented in a preselected direction and a secondary magnetic field is generated so that its flux lines in the operating region are in a direction opposite to the primary field. The total magnetic field in this operating region common to both fields is detected and the field



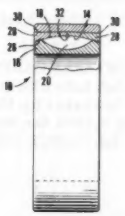
strength of the secondary field is controlled in accordance therewith so that the detected field strength is diminished. The consequent forces on the field generating means can be used for leviation or suspension. Thus, if the primary magnetic field generating means is fixedly mounted, the object which is then a part of the secondary magnetic field generating means can be levitated, and vice-versa.

3,815,964

BEARINGS

Wilfrid H. Bendall, 12 Castle Hill Rd., Pawcatuck, Conn. 02891

Continuation-in-part of Ser. No. 239,210, March 29, 1972, Pat. No. 3,756,674. This application June 5, 1972, Ser. No. 259,762
Int. Cl. F16c *33/66*
U.S. Cl. 308—78 **10 Claims**



Concentric bearing ring members have contiguous sliding bearing surfaces, the bearing surface of one of the members having alternating axially disposed bearing portions and grooves providing lubricant storage capacity. The construction seals and limits lubricant flow to the amount required to maintain a load-supporting film at the bearing contacts. The disclosure illustrates and describes spherical self-aligning, conical thrust, and straight radial bearing embodiments of the invention.

3,815,965

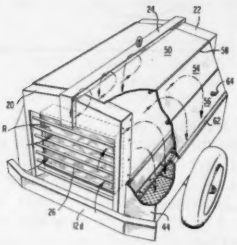
AIR COMPRESSOR HOUSINGS

Richard Ostwald, Bowling Green, Ky., assignor to Gordon Smith & Co., Inc., Bowling Green, Ky.

Filed Oct. 10, 1972, Ser. No. 296,402
Int. Cl. A47b *81/00*
U.S. Cl. 312—100 **17 Claims**

A portable air compressor housing including a main, open frame adapted to support an air compressor for movement over the ground surface via wheels suspended from the frame. The air compressor apparatus is enclosed by housing structure including opposite end pieces upstanding from the frame and

interconnected by an elongated ridge pole from which are hinged folding doors providing full access to the air compressor parts. Below the folding doors, on opposite sides of the housing, are tool box compartments which also close the sides and ends of the housing. The bottom walls of the tool boxes are formed by an open mesh to permit hot air to escape from the housing through the mesh. The open tool box bottoms provide restrictions for the air flow and also aid in establishing a



circuitous air flow pattern through the housing resulting in dissipation of sound and consequent reduction of noise. Further noise reduction may be achieved by baffles mounted on the opposite ends of the frame as well as a baffle mounted below the compressor structure in a horizontal plane under the opening in the main frame. To further reduce noise, the folding doors may be provided with sound absorption panels on the inner sides thereof.

3,815,966

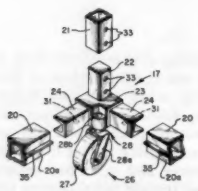
PORTABLE CABINET

Hugh M. Lyman, Jr., Salt Lake City, Utah, assignor to Granite Mill & Fixture Co., Salt Lake City, Utah

Filed Oct. 4, 1972, Ser. No. 294,816

Int. Cl. B62b *3/02*

U.S. Cl. 312—250 **1 Claim**



A roller mounted box shaped cabinet having a rigid exterior framework made up of corner members having center post and sleeve guides projecting therefrom to receive tubular frame members telescoped thereover. The ends of the telescoped tubular frame members are maintained over the center post and sleeve guides by appropriate fastening means forming the rigid cabinet framework. An arrangement of dowels and detents that are mounted to the vertical edges of cabinet walls are fitted into appropriate holes formed in the upstanding frame members to provide an invisible mounting of the cabinet side and back walls to the frame. The edges of cabinet top and bottom panels rest on flanges that project inwardly from the top and bottom tubular frame members.

3,815,967

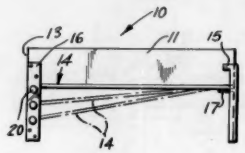
FILE DEVICE

William E. Jocelyn, 5021 Maderia Rd., Virginia Beach, Va. 23455

Filed Mar. 8, 1973, Ser. No. 339,315

Int. Cl. A47b *88/18*

U.S. Cl. 312—327 **4 Claims**



A file device for enabling correspondence and the like to be readily accessible from the bottom of a file. This device consists primarily of a leg supported open box-like structure, having an adjustable tray member which enables the user to remove the first entered correspondence or the like, the device having alternate positions for the tray member which is supported at one end by set screw means.

3,815,968

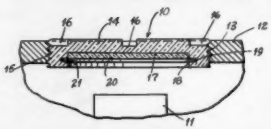
PROTECTIVE LENS FOR PHOTOCELL

George J. Schreiber, Hazelwood, Mo., assignor to Killark Electric Manufacturing Company, St. Louis, Mo.

Filed Feb. 22, 1971, Ser. No. 117,428

Int. Cl. G02b *5/20*

U.S. Cl. 350—1 **5 Claims**



A removable protective lens assembly for a photocell or timing light. The lens assembly can be installed in any box having a side in which a hole can be drilled. The lens assembly includes a Lexan plug threaded into an opening in the box and a filter of transluscent plexiglas supported within the plug by a retainer ring. The lens assembly prevents tampering with the photocell by vandals and filters ultra-violet rays from reaching and damaging the photocell.

3,815,969

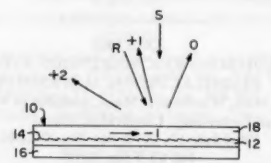
HOLOGRAPHY UTILIZING SURFACE PLASMON RESONANCES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, in respect to an invention by, and James J. Cowan, Huntsville, Ala.

Filed May 31, 1973, Ser. No. 365,644

Int. Cl. G02b *27/00*; **G03c** *1/72*

U.S. Cl. 350—3.5 **5 Claims**



A holographic recording medium employing a substrate having a diffraction grating composed of a plurality of spaced

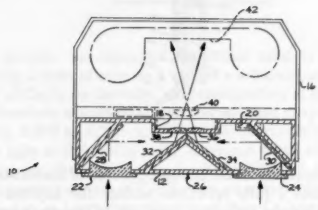
line ridges on a surface thereof together with a first layer consisting of a metal having a plasma wavelength shorter than that of a selected light source and a second layer, or coating, on top of the first layer, consisting of a thin film of photo-sensitive emulsion.

3,815,970

STEREO ATTACHMENT ACCESSORY FOR CAMERAS

Gregory I. Murphy, 4042 Phoenix St., Concord, Calif. 94521

Filed Feb. 26, 1973, Ser. No. 335,487
Int. Cl. G03b 35/08
U.S. Cl. 95—18 R 9 Claims



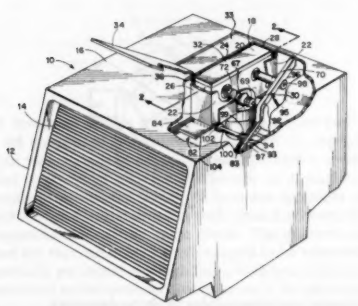
An attachment accessory for cameras to enable taking stereo pair photographs with a normal angle of view on a single film frame having provision for ensuring alignment. Additional embodiments include an adjustment feature to enable use with various cameras including those utilizing a viewfinder.

3,815,971

PHOTOGRAPHIC PROCESSING PROJECTING APPARATUS

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 174,375, Aug. 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 755,901, Aug. 28, 1968, Pat. No. 3,615,127. This application June 18, 1973, Ser. No. 371,146
Int. Cl. G03c 11/00
U.S. Cl. 352—130 32 Claims



Photographic apparatus adapted for operation of a motion picture film cassette for processing of a film strip carried in such cassette and for subsequent projection of the recorded images employing a housing configured to receive the cassette with its projection station in operative relation to a projection lens assembly and a projection lamp, and including a blinder member configured for precluding light from entering the projection station during film processing operations. Preferably, the processing operation is carried out during rewinding of the film strip and the apparatus includes an interlock mechanism configured to automatically displace the blinder member into its operative position and continuously maintain it therein throughout this rewinding operation. In an alternative embodiment, the blinder member is mounted on the cassette and the projector apparatus includes a lever member adapted for actuation of the cassette blinder.

3,815,972

LOW VOLTAGE LIQUID CRYSTAL DISPLAY

Paul Y. Hsieh, Ridgewood, N.J., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Aug. 9, 1972, Ser. No. 279,130
Int. Cl. G02f 1/28; G02n 31/00
U.S. Cl. 350—160 LC 1 Claim

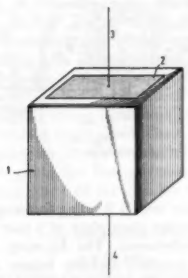
An improved orientation type liquid crystal display having a layer of a mixture of liquid crystal materials confined between a pair of substrates and electrodes for applying an electric field across the substrate. The mixture of liquid crystal materials includes between 5 and 60 percent by weight of an orientation-type liquid crystal material and between 95 and 45 percent by weight of a dynamic scattering type liquid crystal material.

3,815,973

METHOD FOR OBTAINING A HARMONIC FREQUENCY USING A POTASSIUM BROMATE NONLINEAR OPTICAL COMPONENT

Siegfried Haussuehl, Weyertal 82, Cologne, Germany

Filed Mar. 7, 1972, Ser. No. 232,410
Claims priority, application Germany, Mar. 26, 1971, 2114741
Int. Cl. G02f 1/28
U.S. Cl. 350—160 R 1 Claim



A nonlinear optical component having a single crystal characterized by the single crystal being a trigonal crystal of potassium bromate. The single crystal is a piezo electric crystal with electro-optical properties which is useful in a system for either producing a harmonic frequency of electromagnetic radiation in the infrared, visible and ultraviolet spectral range or modulating a beam of electromagnetic radiation. The crystal is also useful as a piezoelectric device for generating acoustical vibrations, for use as a spark generator, for use as a frequency generator, for use as a frequency stabilizer, and for use as an electrical acoustical transformer and receiver.

3,815,974
CAMERA LENS SYSTEM WITH MEANS FOR CORRECTING ABERRATIONS

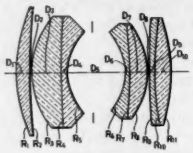
Kikuo Momiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 128,026, March 25, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,228

Claims priority, application Japan, Mar. 30, 1970, 45-26028

Int. Cl. G02b *9/42, 9/60*

U.S. Cl. 350—217 **7 Claims**



In the camera lens system disclosed aberrations occurring at large aperture ratios are corrected for close-up photography. The lens system includes two groups. A front convergent group includes a diaphragm and a rear group includes convergent lenses. The position of the entrance pupil relative to the rear group is movable towards the object when the camera focus is changed from more distant objects to closer objects. The distance between the front group and the rear group is also increased during this change of focus.

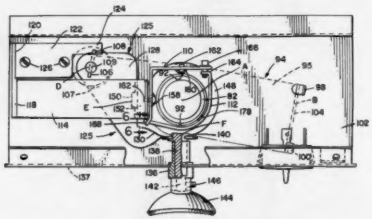
3,815,975
MICROFICHE READER WITH FLOATING LENS

Philip J. Brownscombe, Millington, N.J., assignor to Dietzgen Corporation, Chicago, Ill.

Filed Apr. 30, 1973, Ser. No. 355,589

Int. Cl. G02b *7/02*

U.S. Cl. 350—255 **6 Claims**



A microfiche reader with a floating focusing lens having a shoe riding on the upper glass plate of a pair of glass plates holding a film therebetween. The focusing lens holder is suspended by two parallel, flexible beams and moves in response to changes in the plane of movement of the upper surface of the glass plate to maintain a constant distance between the film and the focal point of the focusing or projection lens.

3,815,976
DAY/NIGHT REARVIEW MIRROR

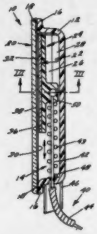
Arthur W. Kurz, Jr., Birmingham, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Dec. 13, 1972, Ser. No. 314,860

Int. Cl. B60r *1/04, 1/06;* **G02b** *7/18*

U.S. Cl. 350—280 **21 Claims**

A day/night, anti-glare, rearview mirror assembly especially adapted for external mounting on vehicles such as automobiles. The mirror assembly is characterized by two mirrors having reflective coatings covering at least a portion of their surfaces, one mirror being stationary and including at least one transparent area, the second mirror movably mounted behind the first mirror and including at least one reflective area selectively registrable with the transparent area via the movement of the second mirror. Registry of the reflective area of the movable mirror with the transparent area of the stationary mirror provides a fully reflective surface for daytime use, whereas moving the reflective area out of registry provides glare-reducing or nonreflective areas for nighttime use. Means controllable from the driver's position within the vehicle are included for actuating the movement of the second mirror.



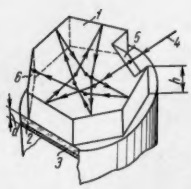
3,815,977
PHOTO-DETECTOR

Vladimir Pavlovich Vasiliev, Bogorodskoe, 48, korpus 23, kv. 239; Boris Mikhailovich Glukhovskoi, Belomorskaya ulitsa, 22, korpus 3, kv. 25; Oleg Mikhailovich Golubovsky, ulitsa Gorkogo, 17, kv. 137; Georgy Eduardovich Kufal, Novogireevskaya ulitsa, 14, korpus 2, kv. 72, and Leonid Filippovich Pliev, Novogireevskaya ulitsa, 23, kv. 66, all of Moscow, U.S.S.R.

Continuation of Ser. No. 162,349, July 14, 1971, abandoned. This application June 8, 1973, Ser. No. 368,119

Int. Cl. G02b *5/04*

U.S. Cl. 350—286 **5 Claims**



The present invention relates to photo-detectors.

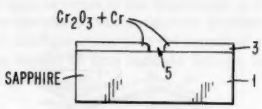
The invention resides in that on the photo-sensitive side a photo-detector has a right prism made of an optically transparent material. The two approximately parallel bases of the prism are bounded by a side surface containing an entrance face through which a light beam is admitted, a reflecting face which together with the base and photo-sensitive layer participates in the reflections of the admitted light beam, and at least one additional reflecting face. The edge of the entrance face, which is a side of the base of the right prism, is unparallel to the first reflecting side face.

3,815,978

DURABLE SEE-THROUGH PHOTORESIST MASK

John Carter Marinace, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 20, 1972, Ser. No. 264,653
Int. Cl. G03c 5/00, 11/00
U.S. Cl. 350—311 16 Claims



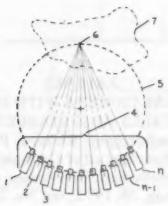
A durable "see-through" photoresist mask is obtained by forming a layer of ruby on a sapphire substrate, and forming a layer of Cr_2O_3 on the ruby. This combination of materials acts to effectively absorb light over the sensitive range of approximately 3,000 to 4,500 A, and yet allows transmission of sufficient light in the visible range to permit visual alignment and positioning of the mask. The mask is fabricated, in one mode, by depositing a layer of $Cr_2O_3 + Cr$ on a layer of sapphire and heating in an inert atmosphere to diffuse Cr into the sapphire and create a layer of ruby intermediate a layer of sapphire and Cr_2O_3.

3,815,979

UNAIDED THREE DIMENSIONAL AIMING POINT PHOTOGRAPHY AND REPRODUCTION METHOD AND APPARATUS

Robert Bruce Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed May 17, 1973, Ser. No. 361,282
Int. Cl. G03b 21/32
U.S. Cl. 352—38 1 Claim



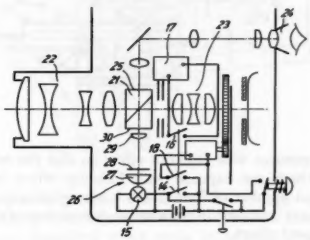
My invention relates to photographing scenes and objects with the purpose of stereoscopic viewing of the reproduction without viewing aids at the eyes. The apparatus is constructed so that a group of stationary cameras or a single camera sequentially positioned at the progressive locations and arranged along a circular arc, aim their optical axes at a point on the opposite side of the same circle. The pictures photographed are then processed and arranged to be repeatedly and sequentially projected at a high frame rate by a stationary projector aimed at the same relative point as in the photographing of the scene or object. This aim-point is coincident with a reflective circularly cylindrical screen surface. The cylindrical obturating surface is part of a circle which contains vertical transparent slits. The observer looks thru a horizontally moving vertical slit to see a stereoscopic picture wherein the pictures for each eye are time progressively generated and different for each eye. Another embodiment of my invention uses rotating minute vertical reflective/dispersive elements in a cylindrical screen surface to reflect and direct the projected pictures to imaginary slits on the same circle containing the screen. For this embodiment no obturating surface is employed between screen and observer and the observer is not restricted in having the slit locus in front of his eyes. The slit locus may be in back of him with the result that the viewer may move quite close to the spatial image in the reproduction of a three dimensional scene.

3,815,980

MEANS FOR AUTOMATICALLY RECORDING A TITLE OR HEADING IN MOVIE CAMERAS

Johann Roth, Schwabhausen, Germany, assignor to Braun Aktiengesellschaft, Frankfurt/Main, Germany

Filed Mar. 27, 1973, Ser. No. 345,478
Claims priority, application Germany, Mar. 28, 1972, 2215189
Int. Cl. G03b 21/32
U.S. Cl. 352—90 14 Claims



A movie camera having a projection arrangement including an objective having a reflecting arrangement, a projection lamp, a title or heading information carrier placed in the projection arrangement in such a manner that the information on it is projected through the reflecting arrangement into the path of the light passing through the objective to the film, an arrangement for causing the recording of the title or heading information on the film strip at the beginning of the operation of the camera including a switching disc biased between a rest position and an end position, a driving means provided on said switching disc, a film advancing mechanism, means for coupling the driving means with the film advancing mechanism, the switching member having a contact operating portion, a switching arm adapted to engage the contact portion, a switch coupled to the switch arm and effecting energization of a projection lamp when in contact with the contact portion, a decoupling means for decoupling the driving means of the film advancing mechanism when the movie camera is open for changing the film, the switch further comprising a contact for energizing the film advancing mechanism when the film receiving space of the camera is loaded and closed again.

3,815,981

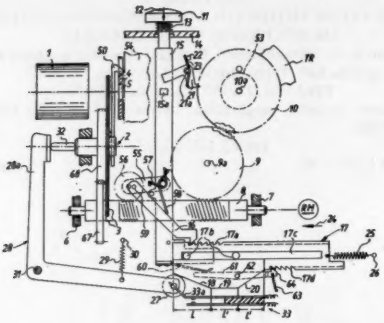
MOTION PICTURE CAMERA WITH FADING MEANS

Siegfried Werz, Munich, and Johann Zanner, Jr., Unterhaching, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 22, 1972, Ser. No. 291,390
Claims priority, application Germany, Sept. 25, 1971, 2148028
Int. Cl. G03b 21/36
U.S. Cl. 352—91 S 9 Claims

A motion picture camera wherein only a predetermined portion of that section of motion picture film which is being transported forwardly while the takeup reel is held against any rotation is exposed with fade-out effect. The film portion is thereupon transported rearwardly in automatic response to completion of exposures with fade-out effect and is ready to be exposed again but with fade-in effect. The difference

between the lengths of the forwardly transported film section and the film portion which is exposed first with fade-out effect and is thereupon transported rearwardly is selected with a view to insure that the claw pull-down can skip one or more film frames during forward transport preparatory to the making of exposures with fade-out effect so that the number of frames which are exposed with fade-out effect invariably equals that number of frames which are selected in advance for rearward transport in response to completion of exposures with fade-out effect.



3,815,982

MOTION PICTURE FADE-OUT AND FADE-IN ARRANGEMENT USING A FLUID CRYSTAL

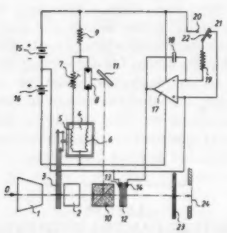
Eduard Wagensonner, Eichenstr, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1972, Ser. No. 305,691

Claims priority, application Germany, Nov. 13, 1971, 2156462

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **10 Claims**



A fluid crystal whose light transmissivity changes as a function of applied voltage is positioned in the path of the light from the objective lens to the film of the camera. Electrical contacts of the fluid crystal are connected to the output and the direction input of an operational amplifier which has an associated timing circuit. Fade-in and fade-out are produced by activation of a switch which alternatively connects the inverting input of the operational amplifier, through a timing resistor, to a battery or to the direct input of one operational amplifier. The fluid crystal is positioned following a standard exposure control circuit in the direction of light propagation towards the film, so that the operation of the exposure control circuit is not affected by the presence of this crystal.

3,815,983

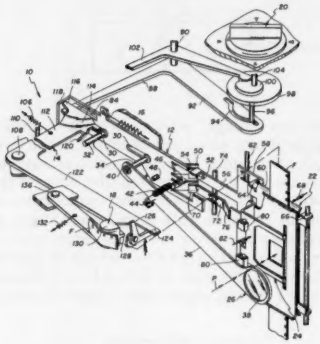
AUTOMATIC REWIND MECHANISM FOR MOTION PICTURE PROJECTOR

William L. Burnham, and Kenneth W. Thomson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1973, Ser. No. 356,701

Int. Cl. G03b *23/00*

U.S. Cl. 352—124 **5 Claims**



An automatic rewind mechanism for a motion picture projector in which an operative slide is provided to establish the position of the film gate, the position of the pulldown claw, the position of an optical douser and set the drive mode for the supply and take-up spindles when rewind is desired. The operative slide is controlled by a release latch which, in turn, may be triggered by either a film tension sensing snubber or a manual "run-rewind" control selector. The control selector is automatically shifted to its "rewind" indicating position when the operative slide is actuated by tension sensing initiated triggering of the release latch.

3,815,984

MOTION PICTURE CAMERA WITH MANUALLY AND AUTOMATICALLY ADJUSTABLE DIAPHRAGM

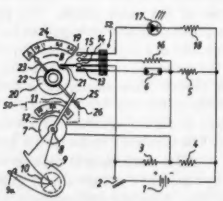
Helmut Mayr, Taufkirchen; Richard Pelte, and Theodor Huber, both of Munchen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 28, 1972, Ser. No. 284,346

Claims priority, application Germany, Aug. 28, 1971, 2143223

Int. Cl. G03b *7/08*

U.S. Cl. 352—141 **13 Claims**



A motion picture camera wherein one or more vanes of a diaphragm are connected to the rotary output shaft of a mov-

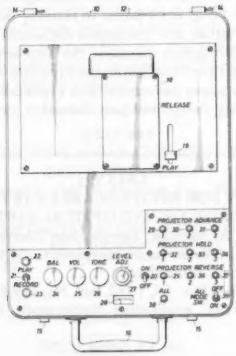
ing coil instrument. The instrument is connected in a diagonal of a bridge circuit one branch of which normally contains a photoelectric resistor so that, when the circuit is balanced, the diaphragm defines an aperture having a size which is a function of scene brightness. The photoelectric resistor can be disconnected from the instrument by a rotary cam whereby the instrument tends to move the vane or vanes to an end position corresponding to the maximum or minimum aperture size. The cam is rotatable by hand and has an arm which can move the vane or vanes of the diaphragm to a desired position as soon as the photoelectric receiver is disconnected. At the same time, the cam completes the circuit of an electric signal generating device to thus indicate that the aperture size has been selected by hand.

3,815,985

MAGNETIC TAPE PROGRAMMING SYSTEM FOR CONTROLLING MULTIPLE ELECTRICAL APPLIANCES

Charles E. McCullough, 5408 Pendleton Ln., Austin, Tex 78723

Filed May 30, 1972, Ser. No. 257,784
Int. Cl. G03b *31/06*
U.S. Cl. 353—15 **21 Claims**



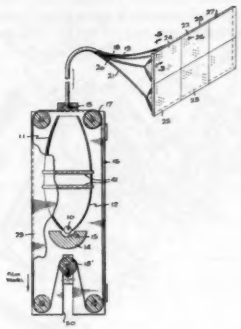
A magnetic tape programming system for controlling multiple slide projectors comprises a multiple track magnetic tape player, at least one audio high-fidelity amplifying circuit for recording and/or replaying audio information from at least one channel of the tape recorder, a tape head for pickup and recording of projector cue signals from another one of the channels of the tape recorder, a record amplifier, a tape replay preamplifier, and a switch for alternately switching the record amplifier and the tape preamplifier into electrical connection with the tape head during the record and playback modes. Multiple encoder-decoder circuits are provided and interconnected to the record amplifier and tape preamplifier and each may be actuated to generate in the record mode a cue signal for recording on the tape to control one of the projectors, and each receives in the playback mode the recorded cue signal from the tape recorder, detects the cue signal and generates a projector control signal for application to one of the projectors.

3,815,986

DYNAMIC GRAPHIC DISPLAY SYSTEM

Paul V. Darbee, 5633 E. Las Santos Ave., Long Beach, Calif. 90815

Filed May 22, 1972, Ser. No. 255,424
Int. Cl. G03b *27/00*
U.S. Cl. 355—1 **8 Claims**



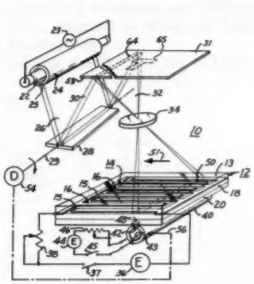
An improved graphic display system or sign presenting dynamic images for educational, entertainment, or advertising purposes is described which gives an infinite choice of the images to be displayed with minimum complexity in generating such images and maximum resolution and maximum brightness in the displayed images.

3,815,987

MAGNETIC IMAGING

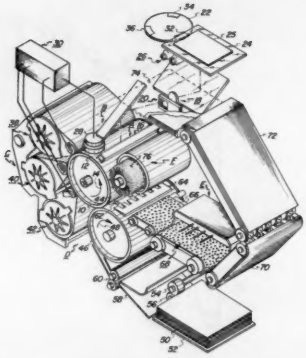
Sherman W. Duck, Alhambra; Frederick J. Jeffers, Altadena, and James U. Lemke, Del Mar, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 29,584, April 17, 1970. This application Dec. 27, 1972, Ser. No. 318,809
Int. Cl. G03g *15/00, 19/00*
U.S. Cl. 355—3 R **7 Claims**



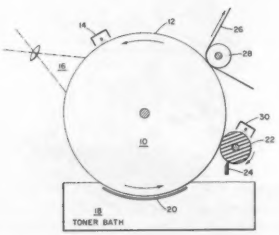
A composite recording medium comprises a photoconductive layer, a plurality of interdigitated first and second electrodes in electrical contact with the photoconductive layer, and a magnetic recording layer in heat-transfer relationship with the photoconductive layer. Methods and apparatus for magnetically recording an image with the assistance of this composite recording medium are also disclosed.

3,815,988
IMAGE DENSITY CONTROL APPARATUS
James H. McVeigh, and George N. Tsilibes, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 17, 1973, Ser. No. 361,112
Int. Cl. G03g 15/00
U.S. Cl. 355—3 R 10 Claims



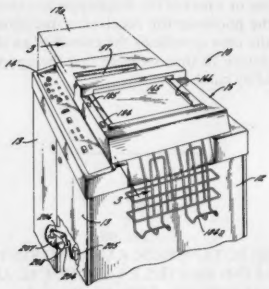
An apparatus in which the potential of a sample electrostatic latent image recorded on a photoconductive surface is detected for controlling the density of toner particles deposited on a single color electrostatic latent image recorded thereon.

3,815,989
ELECTROPHOTOGRAPHIC COPY SYSTEMS
Austin E. Davis, Nashua, and Peter A. Agostino, Wilton, both of N.H., assignors to Nashua Corporation, Nashua, N.H.
Filed Dec. 14, 1972, Ser. No. 315,104
Int. Cl. G03g 15/10
U.S. Cl. 355—10 7 Claims



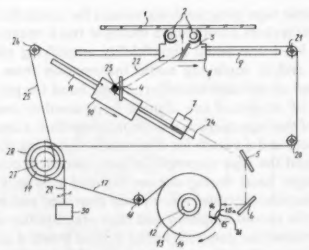
In electrophotographic copy systems in which the electrostatic image is developed from a liquid developer containing charged toner particles, and subsequently squeegeed to remove excess developer, improved definition and less background results if a charge of polarity the same as the image is applied to the squeegee.

3,815,990
HIGH SPEED COPY MACHINE
Harley M. Newcomb, Bensenville; Seno Sparer, Evanston, and Robert K. Abrahamson, Skokie, all of Ill., assignors to Apeco Corporation, Evanston, Ill.
Filed Apr. 19, 1972, Ser. No. 245,527
Int. Cl. G03g 15/00
U.S. Cl. 355—13 9 Claims



A high speed, compact, electrostatic copy machine mounting a roll of copy paper from which copy sheets are cut, and including a triangular copy paper path and a dog leg optical path interfitted in a narrow cabinet frame. A lens and mirror system in the optical path is shiftable so that originals of different sizes can be copied on one size of copy sheet. The original is flash illuminated by a xenon or flash tube lamp under the control of a trigger switch in the copy paper path so that images are produced without stopping the copy sheet. A control circuit holds copy paper in standby position adjacent the exposing station, and operates a document feeding unit to feed and hold originals adjacent the exposure window and deliver them in timed relation to the exposure window thereby initiating copy paper movement and exposure. Interlock, automatic clearing delay, and jam detection switches are provided.

3,815,991
DRIVE FOR RECIPROCABLE PARTS OF A PHOTOCOPYING OPTICAL SYSTEM
Willem P. H. A. Janssen, Blerick, and Martin G. Paulissen, Horst, both of Netherlands, assignors to OCE-van der Grinten N.V., Venlo, Netherlands
Filed Dec. 15, 1972, Ser. No. 315,598
Claims priority, application Netherlands, Dec. 20, 1971, 7117500
Int. Cl. G03b 27/70
U.S. Cl. 355—66 6 Claims



In photocopying apparatus wherein originals are exposed stripwise by an optical system having reciprocable parts moved from rest position by a rope-like traction element, the

time required for bringing these parts to the speed of the copying cylinder is limited by leading the traction element to a reel, by which it advanced for each exposure, over a roller spaced at a limited distance from the reel so that in an initial phase of rotation of the reel an angle between its periphery and the traction element is progressively diminished with corresponding gradual acceleration of said parts. The rate of acceleration and inertia effects at the outset of the reel movement can be further limited by fixing an end of the traction element in a recess having a side wall sloped smoothly inward from the periphery of the reel, so that the traction element will be engaged by that wall before being engaged and pulled upon said periphery.

3,815,992

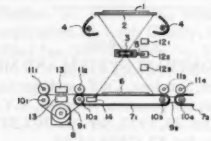
PROJECTION TYPE DUPLICATOR

Masaya Ogawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 872,548, Oct. 30, 1969, abandoned. This application June 30, 1972, Ser. No. 268,123

Int. Cl. G03b *27/54, 27/72*

U.S. Cl. 355—69 **3 Claims**



The present invention relates to a projection type duplicator and more particularly, in a duplicator changable of the magnification a projection type duplicator in which the quantity of light of radiation from a light source for lighting up a manuscript is set up corresponding to the magnification and although the magnification is changed the proper exposure for a photosensitive paper is radiated.

3,815,993

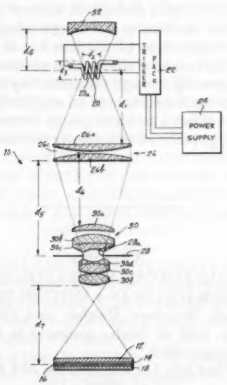
LIGHT PROJECTION APPARATUS AND METHOD FOR PHOTOPRINTING

Martin Tarabocchia, 14710 Dunbar Ln., Woodbridge, Va. 22191

Filed Feb. 15, 1972, Ser. No. 226,433

Int. Cl. G03b *27/02*

U.S. Cl. 355—78 **18 Claims**



Light projection apparatus and method for illuminating a mask in the photoprinting of a photosensitive material. A light source produces a light of a desired frequency range. A condensing lens system is utilized to produce a region of substantially collimated light, and an objective lens system projects an image of an imaginary surface of that region to illuminate the mask. The mask may be in or out of contact with the photosensitive material.

3,815,994

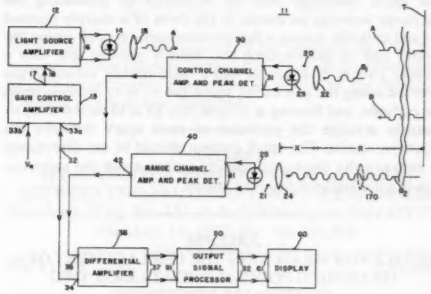
SYSTEM AND METHOD FOR MEASURING DISTANCE

Vernon D. Peckham, Colorado Springs, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Mar. 31, 1972, Ser. No. 240,015

Int. Cl. G01c *3/08*

U.S. Cl. 356—4 **25 Claims**



Disclosed are a pair of light intensity detectors spaced apart in range. Included is an arrangement for reflecting light from a target to each detector and maintaining the intensity of the reflected light detected by one detector constant whereby the output signal of the other detector is a measure of range. Included is an arrangement for processing, linearizing and displaying the signal representing target range. The system disclosed employs the method of reflecting electromagnetic energy of varying intensity from a target to maintain the intensity of reflected energy at one position constant while monitoring intensity at a second position to measure range.

3,815,995

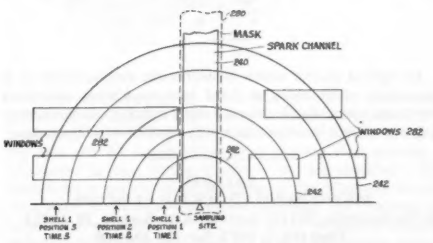
METHOD AND APPARATUS FOR SPARK SPECTROSCOPY BY DERIVING LIGHT FROM LIMITED PORTIONS OF THE SPARK DISCHARGE

John P. Walters; Steven A. Goldstein, and William S. Eaton, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 4, 1972, Ser. No. 223,605

Int. Cl. G01j *3/30*

U.S. Cl. 356—86 **25 Claims**



A stabilized spark discharge is produced so that the electrical spark always follows substantially the same path or chan-

nel between anode and cathode electrodes forming an analytical spark gap. The cathode is preferably made of, coated with, or otherwise supplied with the sample material to be analyzed. Greatly improved spectroscopic analysis is made possible be deriving the light for carring out such spectroscopic analysis only from preselected portions of the spark discharge such as the luminous wings outside the spark channel. Such unique portions or shells are caused by the rapid expansion of the plume or cloud of the sample material explosively vaporized from the cathode by the spark discharge. The spectral lines derived from the wings of the discharge are due largely to the excited vapor of the sample material without substantial interference from the complicated background spectral lines emitted by the spark channel due to the ionized gas which supports the spark discharge and also due to the interaction between the ionized gas and the vapor of the sample material. The spark discharge may be stabilized by producing the discharge between an anode in the form of a sharply pointed pin and cathode having a flat or other surface confronting the anode; and by surrounding the sharply pointed pin with a laminar stream of argon or some otjer readily ionizable gas directed along the axis of the spark gas so as to impinge upon the cathode, and flowing at a rapid rate so as to sweep away or spatially arrange the products of each spark between the repetitive sparks. The spark current should be uni-directional to enhance the discharge stability and to avoid the vaporization of solid material from the anode.

3,815,996

DEVICE FOR MEASURING THE DISPLACEMENT OF A MEASURING POINT ALONG AT LEAST TWO COORDINATE DIRECTIONS

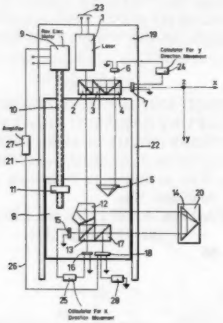
Bertil Colding, Vasteras; Nils Abramson, and Unto Sandstrom, both of Stockholm, all of Sweden, assignors to Lasergruppen Konsult AB, Stockholm, Sweden

Filed Oct. 3, 1972, Ser. No. 294,571

Claims priority, application Sweden, Oct. 13, 1971, 12966/71

Int. Cl. G01b *9/02*

U.S. Cl. 356—106 **3 Claims**



An optical device which measures the displacement of a measuring point along at least two coordinate directions which are perpendicular to each other utilizing a laser beam as a source of light in conjunction with a pair of interferometers.

3,815,997

PHOTO PRISMATIQUE POLARISCOPE

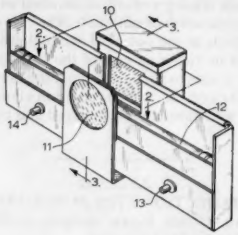
St. Barth Alaska, 3811 S. Scouville Ave., Berwyn, Ill. 60402

Filed Oct. 2, 1972, Ser. No. 294,480

Int. Cl. G01n *21/40*

U.S. Cl. 356—114 **3 Claims**

An opthalmic lens tester is disclosed which employs a source of conventional incandescent light coupled with a reflecting dispersive prism and a pair of crossed polarizers to determine chemical or stress hardening conditions of such lenses. The tester also employs a source of "black" light to test a lens to determine if it is of the Photosun or the Photogray type.



3,815,998

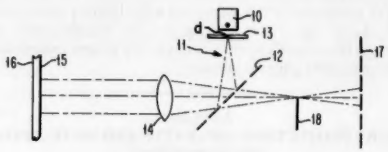
SURFACE CONTRAST SYSTEM AND METHOD

Armin Rudolf Tietze, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,337

Int. Cl. G01b *11/30*

U.S. Cl. 356—120 **15 Claims**



A system and method for generating a shadow image of the surface of an object, the image capable of quantitative surface measurement by direct measurement of the slope of the surface at a given location, from which a surface roughness figure may be determined. Light of a defined angular distribution is directed upon the object surface. A collecting lens transmits an image of the surface to an image plane. An aperture located at the focal plane of the lens has at least a portion thereof in the light path to block out a portion of the possible angles of light passing through the collecting lens, limiting the reflected light from the surface to an angular light distribution in the beam to effect a contrast image between at least two areas in the image plane of an intensity contrast of at least two per cent.

3,815,999

DYNAMIC LOAD FORCE CALIBRATING SYSTEM AND A METHOD FOR ITS USE IN A MOTION TEST SYSTEM

Dewie E. Black, Dearborn Heights, and Donald F. Fabry, Garden City, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

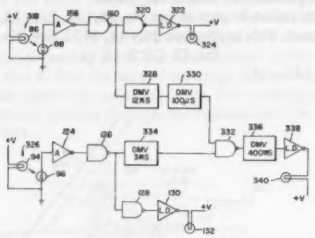
Filed July 5, 1972, Ser. No. 269,169

Int. Cl. G01b *11/26*

U.S. Cl. 356—138 **8 Claims**

A dynamic load force calibrating device is provided in which the displacement of one moving member to which a

driving force is being applied relative to a following member to which it is resiliently coupled and to which an adjustable



load force is being applied is compared to a reference displacement representative of a desired load force to dynamically verify thereby the amount of load force being applied.

3,816,000

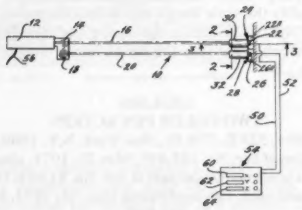
THREE AXES ALIGNMENT MEANS

George C. Fiedler, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis County, Mo.

Filed Jan. 24, 1972, Ser. No. 219,997

Int. Cl. G01b *11/26*

U.S. Cl. 356—152 **20 Claims**



Apparatus for accurately aligning equipment such as the electronic and optical direction sensing, direction indicating and direction finding equipment used on air and space vehicles and the like, the apparatus including a laser, beam splitter, and angle sensing detector means positioned to respond to the laser beam energy for producing electrical signal outputs for use in aligning equipment in mutually perpendicular planes representing roll, pitch and yaw, said detector means being able to detect angular deviations about any one or more of the three mutually perpendicular axes. Lateral displacement and angular deviations being relative to an established plane of the laser beams. The subject device has diverse uses including being used to align guidance components and systems, aiming, sighting, tracking and other electronic and optical devices, directional antenna devices and systems, shop tooling fixtures and other applications where precise alignment accuracy of one member with respect to another or with respect to an established frame of reference is required and with less man power being required.

3,816,001

MEASURING LENGTH AND VELOCITY OF SINGLE STAPLE FIBERS WITHIN AN AIRFLOW

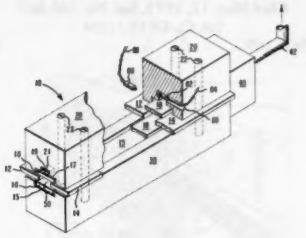
William Lankford Duncan, 1232 Frederick St., Waynesboro, Va. 22980, and Ronald George Heitz, 1430 Forbes St., North Tonawanda, N.Y. 14120

Filed June 20, 1972, Ser. No. 264,580

Int. Cl. G01b *11/00*

U.S. Cl. 356—167 **9 Claims**

Apparatus and method for determining length of textile staple filament specimens. The apparatus includes an elongated capillary-like enclosure with a vacuum applied at one end and with light sources and photodetectors along the capillary. A staple filament when introduced into the open end of the capillary is drawn at high speed past the detector arrays and



the average speed of transport of the filament and the time required for the filament to pass a given point are determined by high speed counting apparatus activated by the detectors. Filament length is then computed.

3,816,002

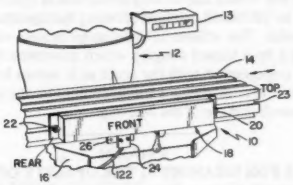
APPARATUS FOR MEASURING DISPLACEMENT BETWEEN TWO RELATIVELY MOVABLE MEMBERS

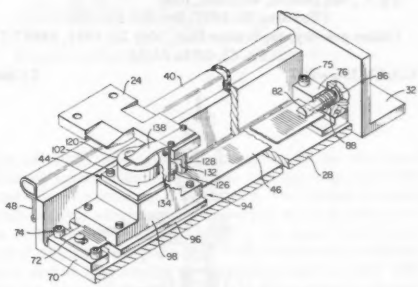
Heinrich J. Wieg, Box 221, R. R. 3, Wilmington, Ohio 45177

Filed Oct. 10, 1972, Ser. No. 296,005

Int. Cl. G01b *11/04*

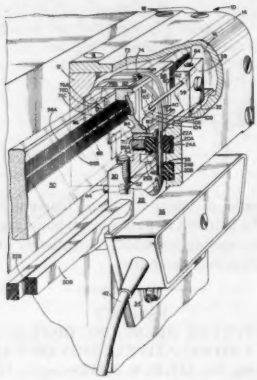
U.S. Cl. 356—169 **13 Claims**





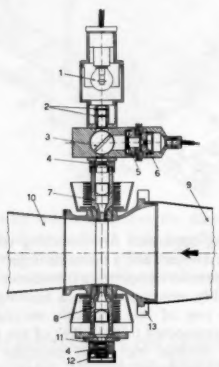
A measuring apparatus for detecting relative movement between a fixed object and a movable object is disclosed. The measuring apparatus comprises a transducer guided on a grating tape slidably mounted within a housing. The housing is connected to one of the relatively moving members. The transducer is connected to the other of the relatively moving members. A flexible ball joint provides the connection between the transducer and the other relatively moving member. Means are provided for length calibration and to compensate for expansion and contraction due to temperature fluctuations. The whole measuring system is self-contained so that the system accuracy is not dependent on relative accuracies of the carrier machine members.

3,816,003
SEALED LINEAR ENCODER
E. David Litke, Andover, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.
Filed Mar. 12, 1973, Ser. No. 340,067
Int. Cl. G01b 11/04
U.S. Cl. 356—169 13 Claims



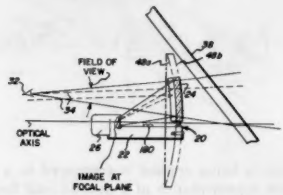
An electro-optical encoder providing uniform high sensitivity measurement of the magnitude and direction of linear motion even under adverse industrial conditions. A scale and reticle are arranged for relative motion and enclosed by a housing having a seal which allows lengthwise travel of a narrow blade coupled to the reticle without allowing foreign matter to enter the encoder. The effects of externally caused vibrations are minimized by a biased coupler which maintains the reticle in uniform engagement with the scale as it moves longitudinally relative to the scale along a track, formed by the scale surface and a smooth surface of the housing.

3,816,004
DEVICE FOR MEASURING THE OPACITY OF SMOKES
Luigi Bignardi, Genova, Italy, assignor to SNAM PROGETTI, S.p.A., San Donato, Milanese, Italy
Filed May 26, 1972, Ser. No. 257,370
Claims priority, application Italy, May 26, 1971, 24997/71
Int. Cl. G01n 21/12
U.S. Cl. 356—207 2 Claims



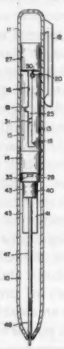
An improved device for measuring the opacity of gases has been disclosed which utilizes a photoelectric optical system and an orthogonally positioned Venturi tube to monitor the opacity of gases.

3,816,005
HEAD-UP DISPLAY
Robert K. Kirschner, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.
Continuation-in-part of Ser. No. 48,148, June 22, 1970, abandoned. This application July 14, 1972, Ser. No. 271,983
Int. Cl. G02b 23/10
U.S. Cl. 356—251 21 Claims



An apparatus for displaying collimated images including an ellipsoidal mirror having a focal surface and means for generating a bar and scale image for the mirror in the focal surface. The means generating a scale image includes an elongated strip of film or tape containing indicia which is positioned intermediate an elongated light source and the mirror to display a scale image on the mirror, and the means generating the bar image includes a transverse bar which reflectively defines a bar image on the mirror intersecting the scale image. The generating means includes means for moving the tape strip to modify the scale image and means for moving the bar to displace the bar image on the mirror and modify the position of intersection between the bar and scale images.

3,816,006
TWO COLOR PEN ACTION
Peter L. Tailer, 323 E. 17th St., New York, N.Y. 10003
Continuation of Ser. No. 145,699, May 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 81,666, Oct. 19, 1970, abandoned. This application Mar. 16, 1973, Ser. No. 342,080
Int. Cl. B43k 27/12
U.S. Cl. 401—30 16 Claims



A two color pen action has inner and outer concentric cylindrical cams with first and second writing cartridge carriers disposed adjacent to each other therein, the outer cylindrical cam containing two longitudinal cam slots and the inner cylindrical cam containing right and left hand first and second spiral cam slots, the cartridge carriers each having a cam follower extending through a spiral cam slot into a longitudinal cam slot. One cam is fixed to the barrel and the other cam is fixed to the cap of a pen so that relative rotation of the cap and barrel selectively extends a writing cartridge. The inner cylindrical cam extends completely through the outer cam and has

an expanding end portion which rotatably locks the cams and thus the cap and barrel together.

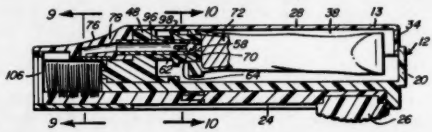
The first cartridge carrier has a width less than the inside diameter of the inner cam allowing the first cartridge carrier to be inserted into the inner cam until its follower is moved into the first spiral cam slot. The inner cylindrical cam contains a channel leading from one end thereof to the second spiral cam slot so that the second cartridge carrier may be inserted in the inner cam adjacent to the first cartridge carrier with its follower passing through the channel into the second spiral cam slot.

3,816,007

DENTAL HYGIENE ASSEMBLY

Daniel W. Fox, Phoenix, Ariz., assignor to Anthony E. De Prima and Thomas Aranda, Jr., both of Phoenix, Ariz., a part interest to each

Filed July 24, 1972, Ser. No. 274,403
Int. Cl. A46b *11/00*
U.S. Cl. 401—146 **3 Claims**



An elongated housing enclosing a supply of toothpaste as well as a toothbrush and with the toothbrush supported lengthwise within the housing and in a manner to have the head end of the toothbrush projected from the corresponding end of the housing. An exteriorly located slide is provided on the exterior of the housing and operably coupled to the toothbrush for extending and retracting the toothbrush relative to the housing. Further, structure operable from the exterior of the housing is provided for pumping toothpaste from the supply of toothpaste within the housing and conveying the toothpaste to the head end of the toothbrush for deposit thereon. In addition, the structure by which the toothpaste is pumped from the supply thereof to the head end of the toothbrush includes a reciprocal actuator which is capable of supporting the toothpaste conveyed to the brush head along the free ends of the bristles of the toothbrush while the latter is maintained in a fully recessed position within the housing.

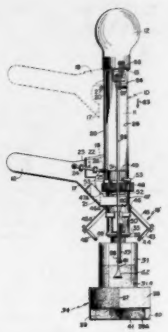
3,816,008

APPLICATOR FOR LIQUIDS

George Sugimoto, 1195 Dominion St., Winnipeg, Manitoba, Canada

Filed Mar. 1, 1973, Ser. No. 336,909
Int. Cl. B43m *11/08*
U.S. Cl. 401—157 **16 Claims**

An applicator for paint, glue or the like includes a barrel with a squeeze bulb on one end and a handle depending therefrom. A disposable flexible tube has an applicator head on one end and is insertable into the barrel and is held in sealing relationship therein so that by pressing the bulb, the walls of the tube collapse and when released allow liquid to be drawn into the tube if the applicator is submerged into a can of liquid. A shut-off device collapses the applicator or adaptor to prevent liquid from flowing from the tube to the applicator



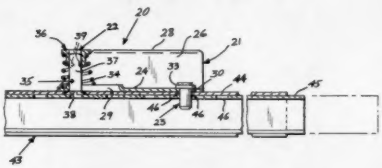
head unless the bulb is again squeezed which forces the desired amount of liquid pass the shut-off and onto the applicator which may be foam or bristle.

3,816,009

LATCH FASTENER

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed May 1, 1972, Ser. No. 249,170
Int. Cl. F16b *7/14*
U.S. Cl. 403—108 **9 Claims**



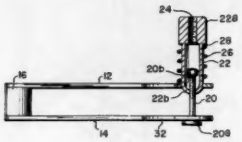
An adjustable latch fastener adapted to be mounted on a telescopic arrangement of members with openings therein to fix the relative position of said members. The fastener includes a latch bracket which has a base portion and a gripping portion. A bolt assembly is connected to the latch bracket in a manner which permits movement of the bracket to a predetermined degree rotationally, longitudinally and pivotally with respect to its point of attachment. The bolt assembly includes a stud and a receptacle member with one of the stud and receptacle members having a spiral cam surface thereon and the other of the stud and receptacle member having a projection mounted thereon so that when the stud and receptacle member are rotated with respect to one another to a predetermined degree, assembly and disassembly of the bolt assembly will occur. In this manner, the latch fastener is adapted to be quickly and efficiently mounted to and removed from the telescopic arrangement of members. An index pin is mounted on the bracket for insertion into a pair of aligned openings in the members so that the fastener may be shifted to permit the members to be altered to a different telescopic position wherein they may be re-engaged with a new set of aligned holes.

3,816,010

JOINT ASSEMBLY FOR A FEELER GAGE BLADE HOLDER

Michael DiRago, Holbrook, N.Y., assignor to Ogar Manufacturing Corp., Holbrook, N.Y.

Filed Sept. 5, 1972, Ser. No. 286,285
Int. Cl. B25g *3/38*
U.S. Cl. 403—157 **7 Claims**



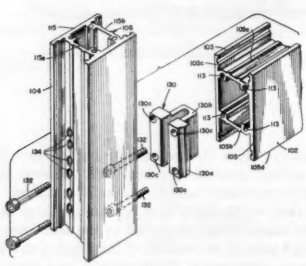
A feeler gage arrangement in which blades of varying thicknesses may be easily inserted into and removed from a holder. The blades are stacked on a fixed pin threaded at one end. A sleeve is freely slidable along the length of the pin and is threaded at one end to mate with the thread of the pin. The blades are securely held when the internal thread of the sleeve mates with the thread of the pin. A spring releases rapidly the sleeve from the pin, and thereby the blades, when the sleeve is unthreaded from the pin.

3,816,011

ENTRANCE STRUCTURE

Lawrence F. Biebuyck, Dallas, Tex., and Eugene Hubbard, Niles, Mich., assignors to American Metal Climax, Inc., New York, N.Y.

Division of Ser. No. 25,457, April 3, 1970. This application June 8, 1972, Ser. No. 260,977
Int. Cl. F16b *7/18*
U.S. Cl. 403—187 **4 Claims**



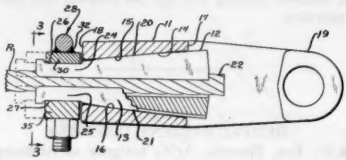
There is provided a new and improved entrance system for a building which permits a latitude of design by the architect. The system includes a door formed of butt joined vertical and side rails, the rails each having side pockets extending beyond spaced webs thereby forming glazing pockets. Longitudinal parts on the tubular structures of the rails defune longitudinal screw splines. Twisting and shear stresses between the rails are reacted through a joint block of general T-shape having a body portion fitting within the glazing pocket of one rail and a tongue portion fitting within the tubular structure of the abutting rail. Screw fasteners extend through the joint block and the rails to secure the rails together.

3,816,012

WIRE ROPE SOCKET FITTING

Clifton H. Hubbell, Downers Grove, Ill., assignor to Sauerman Bros., Inc., Bellwood, Ill.

Filed May 11, 1972, Ser. No. 252,470
Int. Cl. B16g *1/04*
U.S. Cl. 403—369 **7 Claims**



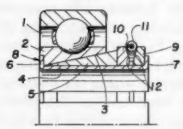
A socket fitting for use with wire rope including wedge means received in a socket to be clamped to the wire rope as a result of a wedging action produced by a tension applied to the rope tending to draw the rope through the socket. Securing means are provided on the wedges for maintaining the wedge elements clamped to the wire rope notwithstanding a discontinuation or reversal of the tension forces. Means are further provided on the wedges for effectively precluding withdrawal of the wedges from the socket as by such a reversal of the tension force.

3,816,013

APPARATUS FOR MOUNTING BEARING ASSEMBLIES

Peter Schuhmann, Olching, Germany, assignor to SKF Industriel Trading and Development Company B.V., Amsterdam, Netherlands

Filed Feb. 20, 1973, Ser. No. 333,811
Claims priority, application Germany, Feb. 24, 1972, 7206850[U]
Int. Cl. F16c *35/06*; B60b *27/06*
U.S. Cl. 403—368 **11 Claims**



An apparatus for the fixing of bearing assembly having a conical bore about a cylindrical shaft. A relatively thin walled sheet-like sleeve is provided surrounding the shaft within the inner bore of the bearing. The sleeve is provided with radial outward projections and an annular wedge member is seated therein. The wedge has a conical surface and a cylindrical surface corresponding to those of the bearing and the sleeve. Compression means are provided to act against the frontal end of the wedge and one of the projections to urge the wedge compressively against the conical inner bore.

3,816,014

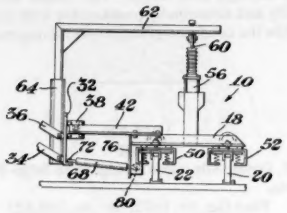
SCREEDING APPARATUS

Adam F. Klopf, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 14, 1972, Ser. No. 169,138
Int. Cl. E01c *19/22*
U.S. Cl. 404—114 **3 Claims**

Screeding apparatus adapted to be carried by a self propelled machine, for finishing concrete-like material to a certain degree of smoothness.

The screeding unit is attached to its raising and lowering carrier from above by a floating single point at or near its forward end and by a pair of pivotally mounted bar-like members



operating between the carrier and the screeding unit. Lateral movement is provided by a positioning member coupled between the carrier and the screeding unit. The screeder follows guide strips but is not carried by such strips.

3,816,015

QUICK-CHANGE CHUCK

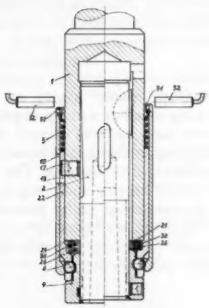
Otto Bilz, Esslingen, and Otto Fauth, Nellingen, both of Germany, assignors to Firma Otto Bilz Werkzeugfabrik, Nellingen, Germany

Filed Jan. 11, 1972, Ser. No. 217,065

Claims priority, application Germany, Jan. 15, 1971, 2101679

Int. Cl. B23b *31/22, 49/00*

U.S. Cl. 408—6 **10 Claims**



A quick change chuck of the type which by the manipulation of an outer control sleeve, a tool-holding collet may be quickly mounted in or removed from a tubular spindle head. The outer end of the collet carries a nut which has an annular groove into which locking balls may engage which are slidable in radial bores in a ball-holding sleeve which is mounted on the outer surface of the spindle head. By sliding the outer control sleeve back or forth along this ball-holding sleeve, the balls will either be pressed partly into the groove in the nut so as to connect the nut and the ball-holding sleeve to each other or the balls will be radially released from the nut and pass partly into an inner recess in the control sleeve. The ball-holding sleeve is also slidable for a limited distance along the spindle head against the action of a spring from a forward idling position to a rear working position of this sleeve and also of the collet. The ball-holding sleeve and the collet remain in the idling position, for example, when the machine is stopped or when the collet carries no tool or a broken tool, and they are shifted to the working position by the cutting pressure of the tool upon a workpiece. One or the other of these positions may be indicated by a measuring instrument, for example, an electronic switch or a countertube, the actuation of which may also be used for controlling the operation of the machine.

3,816,016

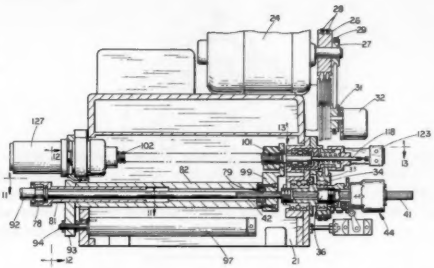
POWER DRILLING MACHINE WITH RESISTANCE TRIGGERED RETRACTION

Edward W. Schatzman, South Fort Mitchell, Ky., assignor to Avey Machine Tool Co. Division of the Motch & Merryweather Machinery Company, Covington, Ky.

Filed Nov. 9, 1972, Ser. No. 305,124

Int. Cl. B23b *47/24*

U.S. Cl. 408—11 **7 Claims**



A drilling machine which includes a spindle and a rotatably mounted lead screw mounted for movement parallel to the direction of spindle movement. The lead screw is connected to a spindle housing in driving relation. Resilient means resists movement of the lead screw in a direction opposite to that of housing and spindle feed movement. The lead screw is turned to advance the housing and the spindle. A switch operating means connected to the lead screw is arranged to actuate a switch when the lead screw advances a predetermined distance against the resilient means. Switch controlled mechanism causes retracting of the housing and the spindle.

3,816,017

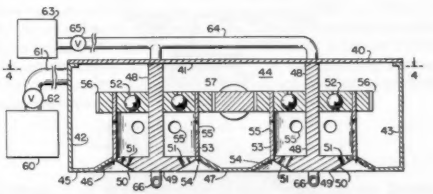
HOLE CUTTER FOR FILM COVERED PACKAGES

Claudiu Corban, c/o Tele-Sonic Trescott Division of Empsco, Inc., 1835 Thirty-Eighth St., Long Island City, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,666

Int. Cl. B23b *41/00*

U.S. Cl. 408—19 **6 Claims**



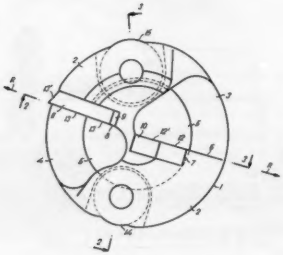
Arrays of articles packaged as a unit in shrink film or the like have holes cut in the film to allow the pricing of the individual articles while they are still packaged as a unit. The apparatus of this invention has a head with a bottom surface which drops on the film covered unit, the bottom surface containing annular depressions over each article. A cylindrical rotary cutter extends downward from the head within each an-

nular depression. A vacuum is applied to apertures leading into the annular depressions within the circumferences of the rotary cutters to draw film upward into the annular depressions so that rotation of the cutters will cut holes in the film. The head is then removed from the unit, the vacuum is shut off, and jets blow disks of cut off film from below the head.

3,816,018
BORING BIT

Ladislav Hlocky, Banovce nad Bebravou, Czechoslovakia, assignor to TATRA, narodni podnik, Loprivnice, Czechoslovakia

Filed Oct. 6, 1972, Ser. No. 295,688
Int. Cl. B23b *51/06*
U.S. Cl. 408—59 **5 Claims**

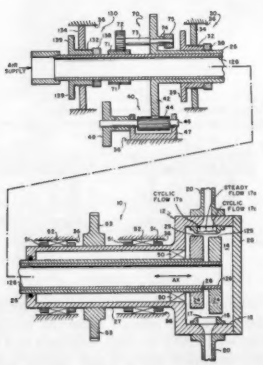


A boring bit comprising a hollow body having a cavity therein for the storage of a lubricant, a pair of discharge passages in communication with the cavity for directing the lubricant and a pair of cutting blades mounted in the bit. The body passages are each provided with an aligned straight-walled portion adapted to mount one of the cutting blades. At least two guide rollers are mounted in the body with their axes of rotation lying in planes substantially parallel with the rotational axis of the bit and substantially perpendicular to the planes of the cutting edges of the blades.

3,816,019
CAM TYPE AIR CONTROL VALVES

George J. Norman, Garrett Park, and Kenneth R. Reader, Monrovia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1972, Ser. No. 283,595
Int. Cl. B64c *15/02, 11/24, 11/02*
U.S. Cl. 416—20 **5 Claims**

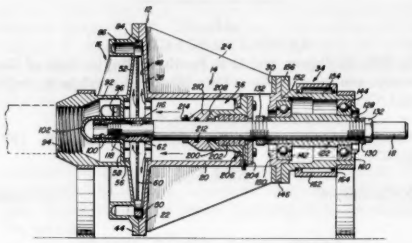


A valve for controlling air flow having a hub adapted to form a plenum therein for maintaining air fed thereinto. At least one nozzle is mounted within the hub for providing a flow path to conduct air from the plenum. Means are mounted within the hub to establish with the nozzles a condition of relative revolving motion and for establishing a quantity of steady air flow through each nozzle and at least one cyclic flow pattern of air through each nozzle. The means within the hub being axially and azimuthally positionable with respect to the nozzles while the condition of relative revolving motion exists.

3,816,020
PUMP

Ethridge F. Ogles, Ada, Okla., assignor to Selgo Pumps, Inc., Ada, Okla.

Filed Oct. 19, 1972, Ser. No. 298,823
Int. Cl. F01d *11/00*
U.S. Cl. 415—111 **13 Claims**



A rotary centrifugal pump having an axial inlet and discharge in a casing together with an impeller having liquid impelling vanes on both surfaces thereof with the impeller having central openings enabling inlet liquid to be impelled by vanes on both surfaces of the impeller. The pump includes a pressured water cooled bearing and a seal in which grease or other lubricant is maintained under pressure by the liquid being pumped. The pump is adapted for use as a single stage or multiple stage and is capable of producing relatively high pressures and high volume discharge.

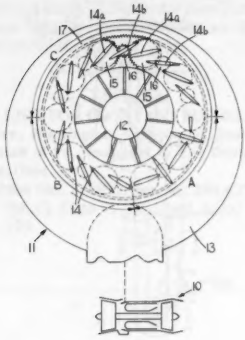
3,816,021
CONTROL VANE ARRANGEMENT FOR A GAS TURBINE ENGINE

Geoffrey Arthur Lewis, Solihull, and Joseph Louis Bloom, Droitwich, both of England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed Dec. 11, 1972, Ser. No. 313,877
Claims priority, application Great Britain, Dec. 11, 1971, 57663/71
Int. Cl. F01d *1/30*
U.S. Cl. 415—147 **10 Claims**

A control vane arrangement for a turbine has an even number of vanes in a duct or chamber surrounding the turbine rotor. Alternate vanes are movable in either direction from positions in which they are transverse to the direction of fluid flow, and the remaining vanes are movable in either direction from positions in which they are substantially aligned with the direction of gas flow. All the vanes move simultaneously and

when one set of vanes is transverse the other set is substantially aligned. Fluid flow to the turbine rotor can be controlled



so as to reverse the direction of rotation of the turbine, fluid flow being effectively shut off before the rotor direction is reversed.

3,816,022

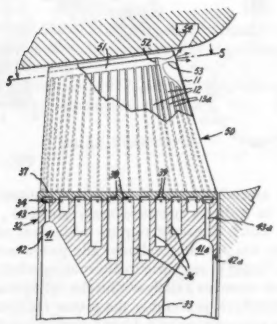
POWER AUGMENTER BUCKET TIP CONSTRUCTION FOR OPEN-CIRCUIT LIQUID COOLED TURBINES

William H. Day, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 1, 1972, Ser. No. 285,631

Int. Cl. F01d *5/18*

U.S. Cl. 416—92 **8 Claims**



Nozzle construction is disposed in the passage employed for the discharge of coolant flow from an open-circuit liquid cooled gas turbine. This improved construction relief upon for the recovery of reaction energy from the coolant is shown applied to both unshrouded and shrouded turbine buckets.

3,816,023

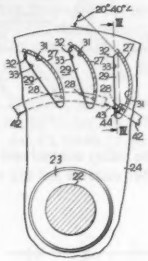
BLOWER WHEEL CONSTRUCTION

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 2, 1972, Ser. No. 294,479

Int. Cl. F03b *3/12*; **F01d** *5/30, 5/32*

U.S. Cl. 416—178 **9 Claims**



This invention relates to the attachment of blower wheel blades to support discs with interlocking notches secured by the wedging action of an internal spring retaining ring acting between the disc and the sloping surface of an inner notch in the blades.

3,816,024

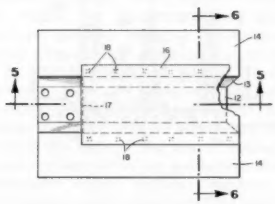
MIXER IMPELLER BLADE

Jerome B. Quinn, Kennett Square, Pa., assignor to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed May 11, 1973, Ser. No. 359,421

Int. Cl. B01f *7/24*

U.S. Cl. 416—210 **7 Claims**



A light weight but strong blade for a mixer impeller is formed of relatively thin steel having a hat cross-section with a thin steel plate covering the outer portion of the cavity formed by the crown portion of the hat section and spot welded to the brim portion. At the inward end of the blade, a barrier closes the crown cavity to prevent fluid flow and pumping action. The outer edges of the crown section are scarfed to prevent eddy currents.

3,816,025

PAINT SPRAY SYSTEM

William J. O'Neill, 1504 Monlemar, Palos Verdes Estates, Calif. 90274

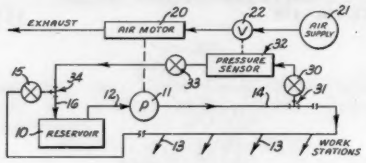
Filed Jan. 18, 1973, Ser. No. 324,571

Int. Cl. F04b *49/08*

U.S. Cl. 417—9 **5 Claims**

A fluid circulation system for a paint spray installation or the like with a recirculating primary fluid circuit from a reservoir through the pump to the work stations and back to the reservoir. A secondary fluid circuit connected downstream of

the pump through a safety control and return to the reservoir, with the safety control functioning to shut off the pump when a malfunction occurs in the primary circuit. A pressure sensitive valve for use as the safety control and incorporating a self-cleaning valve chamber suitable for use with a paint recirculating system.

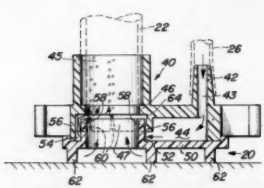


3,816,026

AQUARIUM CIRCULATING APPARATUS

Louis Isaacson, Lexington, and Richard Herrin, Framingham, both of Mass., assignors to Woodingham Investment Company, Cambridge, Mass.

Filed Oct. 24, 1972, Ser. No. 300,220
Int. Cl. F04f 1/18; E04h 3/16, 3/20
U.S. Cl. 417—90 **12 Claims**



An airlift assembly for use in a filter bowl associated with an aquarium tank for pumping the filtered water by means of forced air bubbles expelled through a tube of the assembly thereby circulating the filtered water into the aquarium tank.

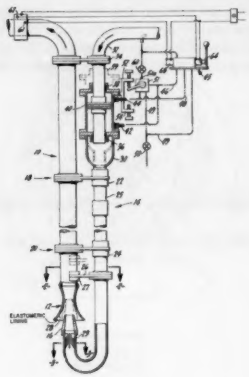
3,816,027

EDUCTOR JET PUMP AND METHOD

John A. Miscovich, Orange, Calif., assignor to Marcona Corporation, San Francisco, Calif.

Continuation of Ser. No. 181,017, Sept. 16, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 398,981
Int. Cl. F04f 5/48; B65g 53/30
U.S. Cl. 417—184 **6 Claims**

An eductor jet pump including a venturi throat mounted at the input end of a discharge line into which a high velocity fluid jet nozzle is directed. Hydraulic cylinders and a hydraulic control circuit provide for relative movement of the jet nozzle toward or away from the venturi throat for either pulsating operation by regular cycling of the nozzle portion, for specific control of efficiency by nozzle position, or for closing the venturi throat to prevent backflow.

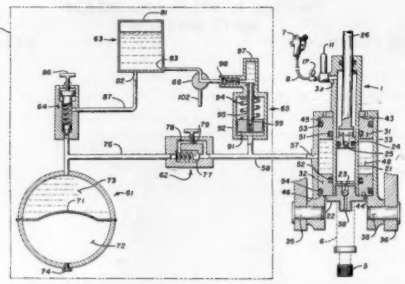


3,816,028

PUMPS AND PAINTING INSTALLATIONS

Robert Andre Gustave Schouteeten, and Andre Julien Augoste Fernand Biais, both of Cosne/sur/Loire, France, assignors to Graco Inc., Minneapolis, Minn.

Filed Oct. 25, 1972, Ser. No. 300,727
Int. Cl. F04b 49/00
U.S. Cl. 417—214 **11 Claims**



A pump assembly which is particularly suitable for supplying liquid to a direct pressure spray gun (i.e., an "airless" spray gun which does not require additional air to atomize such liquid) has pumping cylinder and piston members which deliver the liquid in response to alternating relative movement of the piston member axially within the cylinder member. One of these members, preferably the piston member, has a connection for engagement by a driving element such as an eccentric driven by an electric motor. The other member, preferably the cylinder member, is connected to a supporting element or chassis through a resilient connecting attachment which is prestressed to resist relative axial movement of such other member when the pumping pressures are within the desired range. The resilient attachment permits such relative axial movement, however, to a greater or lesser extent, when the pumping pressures exceed the desired range. Thus the other member moves, at times, more or less as a unit with the

alternatingly driven member of the pump, to reduce or stop the pumping flow at such excessive pressures.

A preferred resilient attachment includes an outer pressure control cylinder within which the pump cylinder body is supported for limited axial movement by two axially movable annular control pistons. Controlling pressures are established by a hydraulic circuit which includes the zone between the control pistons and a pressure accumulator which controls the prestressing of the resilient attachment.

3,816,029

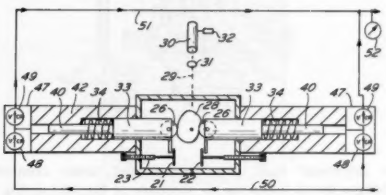
PUMPING UNIT FOR CONSTANT PULSELESS FLOW

John C. Bowen, Huntington Valley, and Rush B. Gunther, Abington, both of Pa., assignors to The Duriron Company, Inc., Dayton, Ohio

Filed Oct. 3, 1972, Ser. No. 294,637

Int. Cl. F04b *49/00, 17/00, 21/02*

U.S. Cl. 417—223 **13 Claims**



A pumping unit for high pressure operation of the order of 10,000 psi or greater including upwards of 150,000 to 200,000 psi is disclosed which is essentially pulseless in its discharge, has no packing but utilizes plungers with hydrostatic supports and seals, and for this purpose two pumps and/or intensifiers are employed actuated by a cam directly or through fluid actuators for each cylinder. The cam has a constant rate of rise with a faster return rate. The return position is adjustable by a variably positioned stop or pick-off so that one cylinder will overcome compressibility and commence discharging fluid when the other cylinder finishes thereby providing a steady discharge flow rate. A simple low pressure hydraulic circuit and an air actuating circuit are described.

3,816,030

AUTOMATIC-FUNCTIONING BREATHER DEVICE

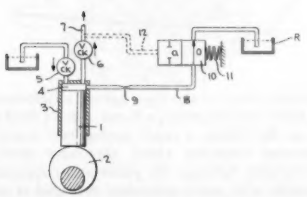
Gunther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Nov. 24, 1972, Ser. No. 308,934

Claims priority, application Germany, Nov. 25, 1971, 2158458

Int. Cl. F04b *49/08*

U.S. Cl. 417—299 **6 Claims**



An automatically-functioning breather system for one or more pumps in which a variable volume chamber communicates, in series, with a restrictor and with the atmosphere through a normally open control valve having a valving element normally urged to an "open" position and in which the control valve communicates with the pump output to which the valving element is subjected to close off communication with the atmosphere during predetermined pressure output conditions of said pump.

3,816,031

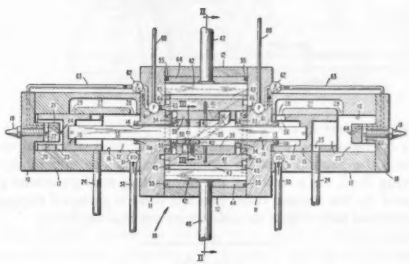
VARIABLE VOLUME ROTARY VANE PUMP HAVING AN INTEGRAL OPPOSED RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

Benjamin Norman Joyce, Sr., Rt. 6, Box 226, Bassett, Va. 24055

Division of Ser. No. 285,650, Sept. 1, 1972. This application June 26, 1973, Ser. No. 373,638

Int. Cl. F04b *17/00*

U.S. Cl. 417—364 **6 Claims**



The invention comprises variable volume rotary vane pump and integral opposed reciprocating piston internal combustion engine, which comprises a central housing through the ends of which pass a shaft, to each end of which is connected a piston housed within a cylinder, which together form an internal combustion engine. On the reciprocating shaft is rigidly mounted a cam follower engaging a cylindrical camming device coaxial with the shaft and having an endless camming groove in its internal cylindrical surface. To this camming device is attached a cylindrical sleeve which forms the inner ring of a variable volume rotary vane pump. The vane pump also comprises a unitary volume adjustment block slidably mounted within the ends of the central housing, with fluid inlet and outlet orifices in the top and bottom thereof. The internal combustion engine includes improved piston and cylinder head designs, and a secondary fluid injection system.

3,816,032

METERING PUMP

Jac B. Flynn, Elgin, and Werner K. Priese, Barrington, both of Ill., assignors to Hills McCanna Company, Carpentersville, Ill.

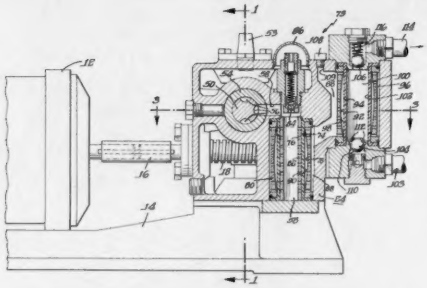
Filed Sept. 13, 1972, Ser. No. 288,532

Int. Cl. F04b *35/02*

U.S. Cl. 417—388 **11 Claims**

A pump has a reservoir containing a supply of driving fluid. Mounted within the reservoir is a drive mechanism for reciprocating a piston within a cylinder. The drive mechanism has an eccentrically mounted member which is slidably surrounded by a sliding block, the latter being enclosed by a cross-head which is connected to the piston and confined so as to reciprocate within the pump. Thus, roary motion is converted to oscillating motion in the sliding block, and the oscillating motion is then converted to reciprocating motion in the cross-head, the reciprocating motion then being transmitted to the piston. Two elastomeric tubes have their ends mounted within the pump so as to permit distortion (expansion or compression) of the central portions of the tubes. In the preferred

embodiment of the invention, a displacement chamber is defined between the piston and the inner surface of the first tube, and an intermediate chamber is defined between the outer surfaces of the tubes, the intermediate chamber containing an intermediate driving fluid. As the piston reciprocates, driving fluid alternately passes into and out of the displacement chamber to cause the first tube to alternate between a first configuration, and a second configuration, which in turn causes the second tube to do likewise via the intermediate driving fluid. As a result of the alternating configurations assumed by the second tube, process fluid is pumped through the second tube. Other modifications are also disclosed.

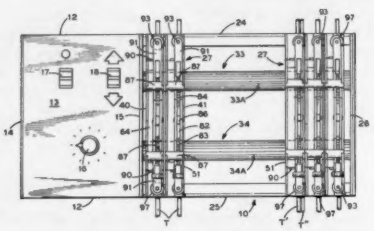


3,816,033

MULTI-CHANNEL PUMP

George Fried, Stamford, Conn., and Oscar Botero, Woodside, N.Y., assignors to Greiner Scientific Corporation, New York, N.Y.

Filed Nov. 21, 1972, Ser. No. 308,418
Int. Cl. F04b *23/04*, *43/08*
U.S. Cl. 417—429 16 Claims



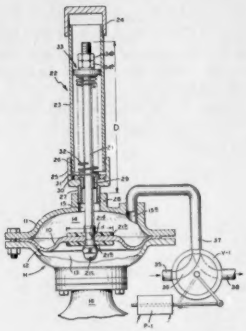
A multi-channel pump and more particularly a peristaltic pump having a single casing carrying drive means, the casing including a portion for receiving from 1 to 10 or more individual pump units which are arranged in side by side relation, each of the pump units being independently operable by the drive means on the casing; each of the pump units being removably mounted on the casing for independent use or removal; each of the pump units carrying flexible tubing for peristaltic action by the pump unit; the drive means on the casing comprising a pair of spaced drive units operating at respectively different speeds, the pump units being adapted to be selectively arranged in either of two positions on the casing so as to operatively engage one of the drive units for operation at one speed or to operatively engage the other of the drive units for operation at the other speed.

3,816,034

DIAPHRAGM PUMPS AND ACTUATING SYSTEM THEREFOR

John B. Rosenquist, Jr., New Canaan, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation of Ser. No. 123,652, March 12, 1971, abandoned. This application May 22, 1973, Ser. No. 362,727
Int. Cl. F04b *43/06*
U.S. Cl. 417—395 4 Claims



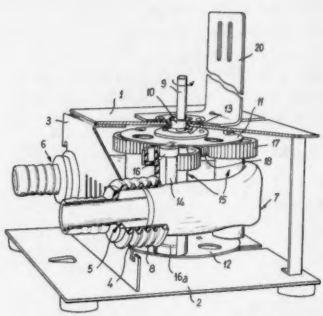
An improved fluid pressure-actuated timer controlled diaphragm pump featuring an auxiliary or booster spring action device containing spring means which store energy from the power stroke, and release the energy to effect the return or suction stroke of the diaphragm.

3,816,035

PERISTALTIC PUMP

Edouard Malbec, Logis de Chalonne, Le Gond Pontouvre, France

Filed Oct. 24, 1972, Ser. No. 300,301
Int. Cl. F04b *43/08*, *43/12*, *45/06*
U.S. Cl. 417—477 2 Claims



A peristaltic pump of the type having a deformable tube carrying a fluid and comprising a frame, a drive shaft mounted rotatably on the frame, a rotor having two axially spaced plates mounted rotatably about the drive shaft, rollers mounted rotatably between the plates and cooperating with the deformable tube, and a gearwheel provided at one of the ends of each of the rollers and connected thereto. The said gearwheel having a larger diameter than the roller, and a drive gearwheel connected to drive shaft and meshing with all the gearwheels connected to the rollers. The deformable tube is

mounted on the rollers with an elastic tension such as to ensure its closure at the points of contact between the tube and the rollers.

3,816,036

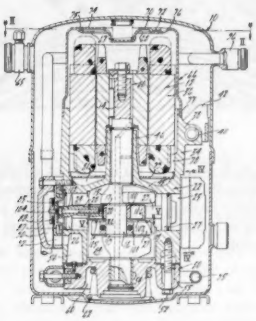
YOKE-TYPE COMPRESSOR

Robert E. Rogers, and George F. Davis, Jr., both of Sidney, Ohio, assignors to Copeland Corporations, Sidney, Ohio

Continuation of Ser. No. 207,841, Dec. 14, 1971, abandoned. This application July 17, 1973, Ser. No. 380,002

Int. Cl. F04b *27/02*

U.S. Cl. 417—536 **2 Claims**



A hermetic motor-compressor assembly includes a spring-mounted rigidly interconnected motor and compressor in a sealed container. The compressor is of the four cylinder direct-driven Scotch yoke type, with two pairs of cylinders at right angles on horizontal axes, the pistons of opposed cylinders being paired by means of a rigid combined yoke and dual connecting rod assembly. The yokes are actuated by rectangular slide blocks fitted on a common crank throw and the yokes and blocks are keyed against displacement with respect to the axes of the cylinders.

3,816,037

DOUBLE WOBBLE PLATE COMPRESSORS

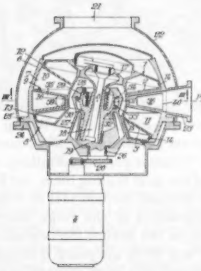
Roger Louis Elysee Germain, Maisons Laffitte, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed Jan. 3, 1973, Ser. No. 320,705

Claims priority, application France, Jan. 25, 1972, 72.525

Int. Cl. F04b *1/16*

U.S. Cl. 418—53 **7 Claims**



The double wobble plate is constituted by two conical elements. The transverse wall passes through the common top of the two conical elements and comprises an aspirating space and a delivery space. The invention is particularly useful for compressors for compressing noxious or toxic gases.

3,816,038

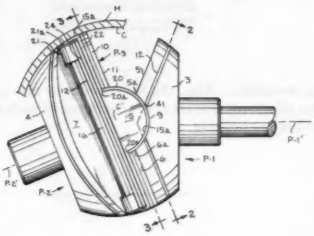
SPHERICAL DISPLACEMENT DEVICE AND SEAL MEANS THEREFOR

Samuel M. Berry, Dallas, Tex., assignor to Commercial Metals Company, Dallas, Tex.

Continuation-in-part of Ser. No. 110,928, Jan. 29, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 318,259

Int. Cl. F01c *3/00, 19/00;* **F04c** *27/00*

U.S. Cl. 418—68 **12 Claims**



The present invention relates to a positive displacement spherical device comprising a housing having a generally spherical cavity of chamber therein with a diametrically extending piston positioned between a pair of rotating wedge-shaped pistons which have their axes disposed at an angle with respect to each other so that rotation of the wedge-shaped pistons causes the central diametrically disposed piston to simultaneously rotate and oscillate to thus positively displace fluids between the adjacent surfaces of the central piston and the end pistons. The present invention also includes seal means for sealing piston to piston and piston to housing in such spherical displacement device to prevent leakage from the high pressure to the low pressure chambers formed between the pistons in the housing. Such spherical displacement device can be used either as a pump, compressor or gas expander and, with the addition of suitable ignition apparatus, as an internal combustion engine.

3,816,039

ROTARY AIR PUMP WITH ROTATING AND OSCILLATING CENTER PISTON

Samuel M. Berry, Dallas, Tex., assignor to Commercial Metals Company, Dallas, Tex.

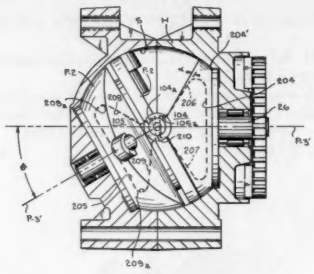
Continuation-in-part of Ser. No. 167,930, Aug. 2, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 318,107

Int. Cl. F01c *3/00;* **F04c** *3/00, 17/00*

U.S. Cl. 418—68 **9 Claims**

The present invention pertains to a low pressure rotary spherical air pump for supplying fresh air to an internal combustion exhaust stream to complete combustion of unburned fuel in the exhaust manifold prior to discharge of the exhaust gases in the atmosphere. The spherical air pump comprises front, center and rear pistons rotatably mounted in a spherical chamber with the front and rear pistons pivotally connected to the edges of the center piston by radially extending pins which are mounted in suitable bearing supports on the pistons. The axes of the pins are perpendicular to each other and converge at the center of the sphere and the axes of the forward and rear pistons also converge at the center of the sphere and are disposed at an angle other than 180° with respect to each other so as to cause the center piston to oscillate as it rotates with the front and rear pistons. The spherical housing is pro-

vided with improved inlet and discharge ports which enable the spherical air pump to draw in, compress and discharge substantially the total displaceable volume of the pump of



each revolution. Also, the front and rear pistons are provided with cylindrical seal areas to seal between such pistons and the surrounding housing.

3,816,040

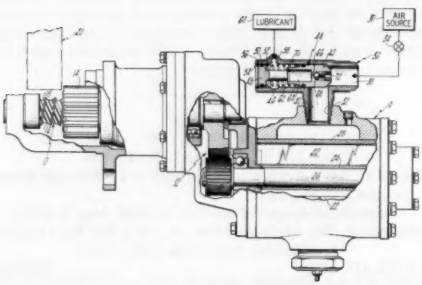
AIR STARTER AND LUBRICATOR THROTTLE VALVE THEREFOR

Lee P. Janik, Hazardville, Conn., assignor to Stanadyne, Inc., Hartford, Conn.

Filed Nov. 9, 1972, Ser. No. 305,004

Int. Cl. F02n *17/00;* **F16k** *21/10;* **F01c** *21/04*

U.S. Cl. 418—88 **8 Claims**



There is disclosed an air starter having an air motor with an inlet valve which throttles the initial pressure build-up downstream of the valve to reduce the initial shock imposed on the starter mechanism. The throttling valve has a chamber in which a trapped lubricant is positioned at the beginning of each starter operation. The trapped lubricant escapes from the chamber through an orifice to regulate the rate of opening movement of the valve and sprays the lubricant into the incoming main stream in a direction opposite to the direction of the incoming air flow to mix the lubricant uniformly with the incoming air.

3,816,041

OIL SEAL FOR ROTARY MECHANISM

Dankwart Eierman, Lindau, Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm and Wankel G.m.b.H., Lindau Bodensee, both of Germany

Filed Jan. 5, 1973, Ser. No. 321,235

Claims priority, application Germany, Jan. 21, 1972, 2202899

Int. Cl. F01c *19/00;* **F04c** *15/00, 27/00*

U.S. Cl. 418—142 **8 Claims**

The dual-sealing oil seal for a rotor of a rotary mechanism which has a plurality of circumferentially spaced webs extending substantially radially between the spaced concentric legs of the oil seal to accelerate oil between the legs to the angular speed of the rotor.

3,816,042

GEAR PUMP WITH BALANCED SIDE SEALING BUSHES

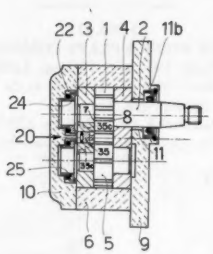
Corrado Menini, Bologna, Italy, assignor to Lamborghini Oleodinamica S.p.A., Argelato (Bologna), Italy

Filed Mar. 15, 1972, Ser. No. 234,788

Claims priority, application Italy, Mar. 17, 1971, 3369/71

Int. Cl. F01c *19/08;* **F03c** *3/00;* **F04c** *15/00*

U.S. Cl. 418—132 **3 Claims**



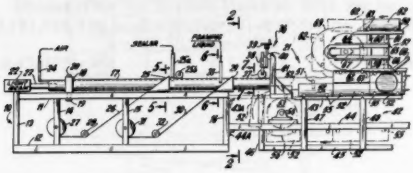
A gear pump for fluids, comprising gears which are laterally sealed by a counter pressure as a function of the delivery pressure. Sealing gaskets pertaining to the counter pressure have cylindrical seats. Counter pressure limiting rings independent of the wall and of the gear sealing bush, yet firmly held against the wall by a mechanical surface seal as a function of the difference in the diameters of the rings, thereby guaranteeing constant adhesion on the part of the contact surfaces between the rings and the wall while the pump is in operation. The rings are placed asymmetrically with respect to the surface of the sealing wall, so as to displace the center of gravity of the counter pressure towards the delivery side and make it coincide with the center of gravity of the internal pressure on the sealing wall.

3,816,043

APPARATUS FOR MAKING HOLLOW TUBING HAVING AN ANNULAR WALL OF FOAMED MATERIAL

Charles D. Snelling, Allentown; Theodore E. Andrews, Kutztown, and John J. Weller, Emmaus, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 69,661, Sept. 4, 1970, Pat. No. 3,754,064.
This application Jan. 22, 1973, Ser. No. 325,509
Int. Cl. B29d 27/00
U.S. Cl. 425—4 C 13 Claims



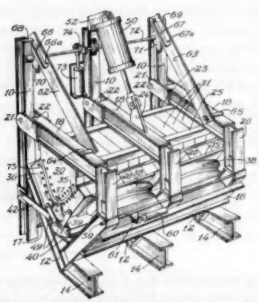
An apparatus and method are provided for continuously forming hollow tubing of foam material comprising a mandrel fixed at one end about which said tubing is formed from a web of material by confining the foam material within an annular space of an envelope of flexible laminar material which is allowed to foam and expand and the envelope of confined foamed material then moved longitudinally of said mandrel and thereafter cured while moving along said mandrel. In order to assure cross-sectional symmetry or concentricity of the hollow tubing, means are provided for aligning the mandrel by controlling its flexure to a position which will provide a product having the desired concentricity, and means associated with a region of the mandrel away from the fixed end for detecting variations in alignment from the desired alignment, whereby when a variation in alignment is detected, the means for aligning the mandrel is actuated to compensate for the detected variation.

3,816,044

AUTOMATIC PRESS

Harold R. Nielsen, and Leo J. Hagenson, both of Kenyon, Minn., assignors to Foldcraft Company, Goodhue, Minn.

Filed Feb. 7, 1973, Ser. No. 330,393
Int. Cl. B29c 3/06
U.S. Cl. 425—157 10 Claims



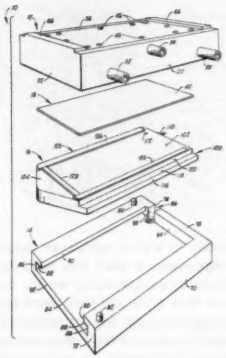
An automatic hot press for forming contoured laminated bench seats utilizing an overhead pivotable heated die to form the inside of the bench against three lower heated dies which form the outside surface of the bench. The central lower heated die is positioned against the sharply curving portion of the bench between the seat and back portions before the other lower dies so as to insure proper forming and prevent cracking of the bench. The entire operation of the press is automatically sequenced with a pressurized air system.

3,816,045

MOLD FORMING DEVICE

Leo P. Cawley; William A. Gurske, and William L. Goodwin, all of P.O. Box 8152, Wichita, Kans. 67208

Filed June 26, 1972, Ser. No. 266,304
Int. Cl. B29c 1/00
U.S. Cl. 425—175 10 Claims



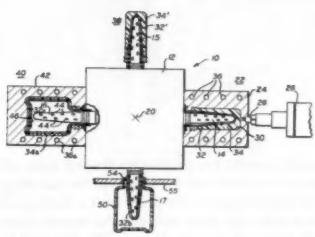
A mold forming device has a first mold member with a portion of a side thereof to receive a layer of gel material. A second mold member is engagable with the first mold member, and has means to form a cavity with the side of the first mold portion, and means to fill the cavity when engaged. The mold forming device is constructed and adapted to form a layer of gel material.

3,816,046

BALLOON BLOWN PLASTIC MOLDING

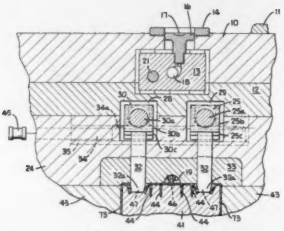
John J. Farrell, 40 Abby Ln., Greenbrook, N.J. 08812

Filed Apr. 24, 1972, Ser. No. 246,878
Int. Cl. B29d 23/03
U.S. Cl. 425—242 B 13 Claims



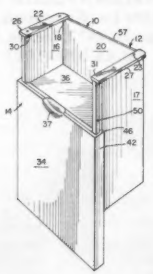
This invention covers the core rod or parison pin of a blow mold machine with a rubber tube or balloon so that the plastic is supported internally during a blow molding operation. The fluid that blows the molding inflates the balloon and has contact with the inside of the balloon instead of with the plastic of the parison. Cooling fluid circulates inside the balloon so that the molding is cooled from both sides to shorten the cycle. Higher pressure fluid can be used without risk of rupturing the molding and blowing can, therefore, be carried out at a lower temperature where the plastic has begun to crystallize and can be oriented for greater strength.

3,816,047
INTERLOCK ACTUATING MEANS FOR MOLD ASSEMBLY
Forrest N. Mohler, Indianapolis, Ind., assignor to E-W Mold & Tool Co., Inc., Indianapolis, Ind.
Filed July 18, 1972, Ser. No. 272,767
Int. Cl. B29c 1/06; B29f 1/02
U.S. Cl. 425—249 **1 Claim**



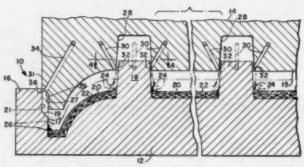
In a mold assembly in which cantilever mounted cores are held tightly in compression at their free ends during a portion of the molding cycle by reciprocable wedge members which engage the cores at their ends and lock them against displacement, a rotating crank element for actuating the wedge members for movement in unison which does not require holding of close dimensional tolerances on associated parts of the mold and which permits actuation of added banks of wedge members for larger molds.

3,816,048
SNOW MOLD
Robert H. Berry, 1905 Cherokee, and John W. Smith, 844 Navajo, both of Carpentersville, Ill. 60110
Filed June 5, 1972, Ser. No. 259,555
Int. Cl. B29c 1/00
U.S. Cl. 425—318 **6 Claims**



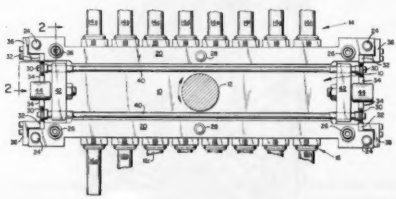
A two-piece mold for producing shaped units of formable material such as snow and the like, and for handling and positioning the shaped units. One piece of the mold provides three sides and at least one open end, and the second piece provides the fourth side and an end closure. The two mold pieces are slidably mated along their edges to an assembled condition in which the first and second pieces are secured to provide an open topped, closed bottom mold. After snow or other shape-holding material is packed into the mold through the open top, and sets its shape, the filled mold is inverted. With the second piece held in place, the three-sided element is drawn past the fixed end closure which is now positioned at the top until the three-sided element is separated. The second element including the end closure is moved laterally from the resulting block of shaped material to leave the shaped unit standing free where initially positioned. The first and second elements of the mold can then be mated for reuse.

3,816,049
MOLDING APPARATUS FOR PRODUCING DECKLE-FREE EDGES AND WINDOWS IN MOLDED FIBER PRODUCTS
William S. Peppler, Chappaqua, N.Y., assignor to Diamond International Corporation, New York, N.Y.
Filed June 29, 1972, Ser. No. 267,375
Int. Cl. B29c 3/00; B29j 5/00
U.S. Cl. 425—324 **9 Claims**



Apparatus and method for forming deckle-free edges and windows in molded fiber products such as cartons, trays and the like, said apparatus comprising a forming mold equipped with non-porous block-out ridge and/or patch members to define the periphery and/or windows in the finished product. The apparatus includes a mating press mold for cooperation with the forming mold with passageways therein through which jets of fluid such as air and/or steam may be supplied from a high pressure source to control deckle accumulated on the forming mold. The method of forming deckle-free windows and/or edges in molded fiber products by applying a fiber pulp slurry on the face of a forming mold and removing deckle from block-out portions of said forming mold by directing high pressure jets of fluid at said mold to blast deckle into upstanding position and away from adjacent portions of said mold and pressing the upstanding deckle down into pulp therebelow thereby concentrating fiber in the vicinity of edges and windows in the finsihed product.

3,816,050
NECK RING MECHANISM FOR A PLASTIC INJECTION
William B. Niemi, East Longmeadow, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.
Filed July 10, 1972, Ser. No. 270,529
Int. Cl. B29c 1/00
U.S. Cl. 425—387 B **7 Claims**



A neck ring mechanism for a plastic injection blow molding machine of the type which has a rotatable head supporting two banks of core pins which extend in opposite directions and wherein the head is rotatable so that while one bank of pins is closed upon by the halves of a parison mold, the other bank of pins is closed upon by the halves of a blow mold. The neck ring mechanism is carried by the head and includes a pair of carriers for each bank of pins. Each carrier supports a bank of neck ring halves which close upon the bases of the pins to define therewith the neck portion of the parison and final product formed on each pin. The carriers associated with each

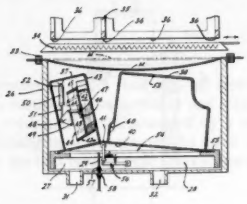
bank are moved simultaneously toward and away from each other by the movement of one such carrier, this movement being transferred to the other carrier by means of a pinion rotatably supported on the head and which is engaged on opposite diametric sides by a pair of racks, one such rack provided on each such carrier.

3,816,051

APPARATUS FOR FORMING ARTICLES FROM PLASTIC SHEET MATERIAL

Norman F. Houghton, Connersville, Ind., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Division of Ser. No. 235,968, March 20, 1972, Pat. No. 3,781,394. This application July 13, 1973, Ser. No. 378,839
Int. Cl. B29c *17/04*
U.S. Cl. 425—388 **3 Claims**



A vacuum-forming operation in which a pair of adjacent compartment liners are formed from a single sheet of thermoplastic material. In the apparatus aspect, a pair of adjacent molds, each affording the desired shape of the inside surface of the corresponding liner to be formed, are mounted along their base portions on frame structure hinged in the region of adjacency of the mold base portions, to provide for pivotation of the base portions so that confronting surfaces of the molds are movable angularly toward and away from one another. One of the molds includes an auxiliary section disposed inwardly thereof, and mounted for selective extensible movement into the region of adjacency of the molds. In the method aspect, a sheet of thermoplastic material is disposed to extend over the molds, and is heated, causing it to soften while the molds are held in pivoted position in which the confronting surfaces are substantially spaced from one another. Mold assist-plugs and the molds are then moved, relative to one another, to urge the sheet into general close conformity with the molds. While the sheet of material is still soft, the assist-plugs further are caused to engage the mold frame structure, through the intermediacy of the sheet, pivoting the frame structure and causing adjacent wall portions of the molds to move toward one another and assume their closely spaced position. Air entrapped between the heated sheet and the walls of the mold not provided with the auxiliary section is then evacuated through a number of small ports or vents in the walls, thereby forming one of the desired liners, whereupon the auxiliary section of the other mold is projected and air entrapped between the heated sheet and the mold is evacuated, forming the other of the desired liners with an undercut region. The liners are then cooled, the extended auxiliary mold section is retracted from the undercut region, and the liners are stripped as a unit from the molds.

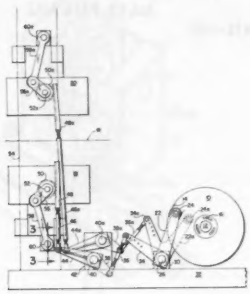
3,816,052

OPERATING APPARATUS FOR THE PLATENS IN A THERMOFORMING MACHINE

Lawrence W. Schoppee, Springfield, Mass., and James L. Meagher, Jr., Rogers, Conn., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed July 17, 1972, Ser. No. 272,577
Int. Cl. B29c *3/00*
U.S. Cl. 425—406 **9 Claims**

A press or platen operating mechanism for a thermoforming machine wherein the platens and their associated molds are closed and opened on a sheet of plastic material by cam operated linkages. The linkages include elements extending from a cam for each platen and the cam and linkages provide for adjustment of the timing and stroke of each platen independently of the other platen. The linkages also include rack and pinion driven toggle links so arranged that the force holding the platens and molds in closed relationship bears upon the machine frame and not upon any guide rods or tie bars generally associated with such relatively movable platens.

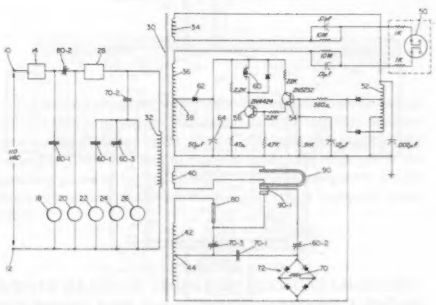


3,816,053

COMBUSTION SUPERVISION SYSTEM

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Apr. 9, 1973, Ser. No. 349,208
Int. Cl. F23n *5/08*
U.S. Cl. 431—78 **8 Claims**



A combustion supervision system for use with a fuel burner includes two time delay devices, each of which provides a time delay as a function of current flow through the device. The first time delay device has a shorter time interval than the second time delay device. The system also includes circuitry for energizing the first and second time delay devices concurrently, circuitry for initiating an ignition sequence at the end of the timing interval provided by the first timing device, circuitry for operating a lockout device at the end of the timing interval of the second device, and circuitry responsive to the sensing of flame by a flame sensor for interrupting the timing cycle of the second timing device.

3,816,054
PHOTOFLASH LAMP HAVING NON-SHORTING CONSTRUCTION

John Baldrige, Jr., Chesterland, and John C. Sobieski, Russell Twp., both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

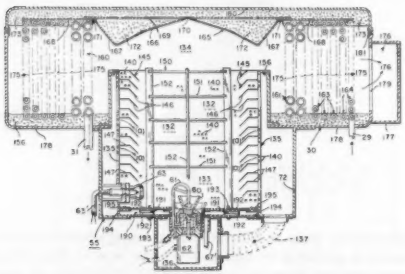
Filed May 2, 1973, Ser. No. 356,459
Int. Cl. F21k 5/02
U.S. Cl. 431—95 12 Claims

A glass sleeve is positioned around one inlead of a photoflash lamp, so that the second inlead is bare for a greater distance from the filament (or other ignition means) than is the sleeved inlead. When the lamp is flashed, the unsleeved inlead burns back farther than the sleeved inlead, thus causing a relatively large electrical path between the exposed parts of the burned-back inleads and reducing the likelihood of them becoming shorted either directly together or by metal fragments in the flashed lamp.

3,816,055
REIGNITER MEANS FOR POWER COMBUSTORS

William P. Lear, Verdi, Nev., assignor to Lear Motors Corporation, Reno, Nev.

Continuation-in-part of Ser. No. 261,691, June 12, 1972. This application June 15, 1972, Ser. No. 263,108
Int. Cl. F23m 9/06
U.S. Cl. 431—171 4 Claims

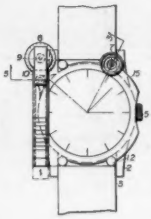


Reigniter means for combustors of vapor generators used in eternal combustion engine systems. The combustors provide heat in response to engine power demand to vaporize liquid in boiler tubes. Combustion emissions are with low noxious pollutant content over the power operating range of the engine system. Internal arrangements in the combustors maximize burning up of fuel that is injected into the primary combustion zone. Portions of the combustor that may reach above 2,100°F are minimized to inhibit the formation of nitrous oxide. Regions that might fall below 1,500°F are controlled to minimize quenching that would result in the formation of carbon monoxide and unburned hydrocarbon particles. The flow of combusted gases is moderated by arranging incoming air to be in the counter direction. Air and fuel particles are thoroughly intermixed towards complete combustion. An important feature is a tower positioned in the route of the gases out of the combustor, for reigniting combustible particles that have not fully burned.

3,816,056
COMBINATION OF A WRIST WATCH AND A CIGARETTE LIGHTER

Roland Clough Brown, 425 Stratford Ct., Del Mar, Calif. 92014

Filed Sept. 20, 1972, Ser. No. 290,629
Int. Cl. F23q 2/32
U.S. Cl. 431—253 1 Claim

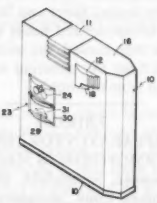


The Watch Match invention is an improvement on a wrist watch by attaching it to a cigarette lighter to obtain many obvious advantages. The invention clamps fuel tanks over the top and under the bottom of the watch case and arranges the lighter ignition mechanism on the left side at the top with the refill fuel valve on the right side at the top. The flint replacement screw with spring and the screws which connect and clamp the fuel tanks together enter from the bottom side, out of view, when the Watch Match is worn. Gas is favored over liquid fuel for safety reasons. Flint or electric ignition systems are included. The Watch Match cannot be mislaid when worn, and is then available for common use in time telling or in igniting smoking materials as well as in emergencies to supply light in the dark or to ignite a fire. With the Watch Match one is never without a match.

3,816,057
INFORMATION DISPLAY DEVICE FOR CIGARETTE LIGHTERS

Nicholas E. Semenko, 507 Sinclair Ave., Selkirk, Manitoba, Canada

Filed Feb. 8, 1973, Ser. No. 330,593
Int. Cl. F23q 2/32
U.S. Cl. 431—253 2 Claims



Each time a cigarette lighter is actuated, a film picture frame is presented behind a magnifying window in the lighter casing. This film frame may be paid advertising or information material as desired.

3,816,058

LIGHTER WITH SINGLE MEMBER VALVE ACTIVATOR AND SPARK GENERATOR SUPPORT

Patrick R. Court, Los Angeles, Calif., assignor to Paul G. Garrity, Stamford, Conn.

Filed Mar. 7, 1973, Ser. No. 338,991
Int. Cl. F23q 1/04
U.S. Cl. 431—254 7 Claims

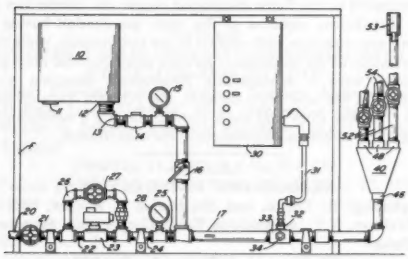
A lighter containing a fuel reservoir, lift type valve means and a pivotally mounted valve activator and sparkwheel combination, the combination characterized by a single molded member comprising the pivot means, the valve activator, the pressure piece, the flint tube and the sparkwheel carrier.

3,816,059

IGNITION APPARATUS FOR FLARE STACKS AND THE LIKE

John F. Straitz, III, Jenkintown, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Feb. 15, 1973, Ser. No. 332,624
Int. Cl. F23g 9/00
U.S. Cl. 431—278 5 Claims



Ignition apparatus for flare stacks and the like is disclosed which includes air and combustible gas supply pipes connected to a flame pipe, the flame pipe having a spark plug to fire the gas-air mixture in the flame pipe and provide a flame front, a flame splitter receiving the flame from the flame pipe and having interior walls dividing the flame into a plurality of flame sections for delivery through different flame tips at the top of a flare stack burner or other desired locations. Controls are provided to control the flow of the gas and air and of the flame.

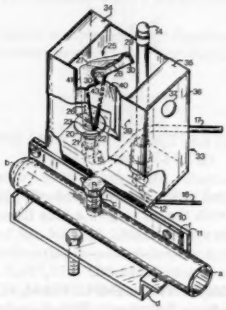
3,816,060

SAFETY PILOT ENCLOSURE HAVING FLAME-DIVERTING AIR INLET

Nick J. Koskolos, Affton, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Apr. 23, 1973, Ser. No. 353,342
Int. Cl. F23d 15/04
U.S. Cl. 431—350 7 Claims

A gust-protecting safety pilot enclosure utilizes a hood which directs the pilot flame in two tongues, one of which heats a thermocouple within the enclosure and the other extends slantingly through the upper portion of the enclosure wall to ignite the main burner. A horizontal air flow opening in the enclosure wall beyond the thermocouple serves, when the pilot flame height is reduced, to divert a portion of the flame



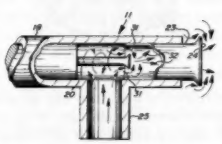
from the tongue which extends toward the thermocouple to the tongue which extends toward the main burner, thereby to prefer ignition of the main burner over voltage output from the thermocouple.

3,816,061

FUEL MIXING CHAMBER FOR HEATING TORCHES

Carl R. Guth, 10215 N. 38th St., Phoenix, Ariz. 85020

Filed Dec. 4, 1972, Ser. No. 311,671
Int. Cl. F23d 15/02; B05b 7/06
U.S. Cl. 431—352 6 Claims



A gas mixing chamber and method of mixing fuels for a fuel burning torch utilizing air resistance or drag together with air aspiration to draw fuel from a pair of nozzle tips sequentially arranged in the torch and to mix the air in two stages with the expanding gases or liquids in highly efficient manner to create a thorough mixing of the air and fuel to effect complete combustion.

3,816,062

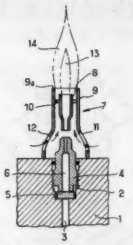
BURNER HEADS OF LIQUEFIED FUEL GAS LIGHTERS

Daniel Bouvier, Paris, France, assignor to Societe S. T. DuPont, Paris, France

Filed Sept. 26, 1972, Ser. No. 292,315
Int. Cl. F23d 13/40
U.S. Cl. 431—355 4 Claims

In a lighter fueled by liquified gas there is less danger of injury or damage to property when the flame is visible. If the gas is mixed with a relatively large amount of air the flame, though stable in air currents, is blue and invisible or almost so, whereas if there is little or no air mixed with the gas the flame is a visible yellow but relatively unstable. In a lighter formed according to the invention a burner is formed with two concentric upright tubes the outer of which surrounds a gas nozzle from the gas reservoir and the inner of which is coaxial with the nozzle but located a little thereabove. Air admitting aper-

tures are provided at the lower end of the outer tube. Gas from the nozzle through the central tube mixes with little or no air



and gives a central yellow flame, whilst gas passing between the tubes mixes with the air to give a blue flame surrounding and protecting the yellow flame.

3,816,063

PROCESS FOR HEATING INDUSTRIAL FURNACES

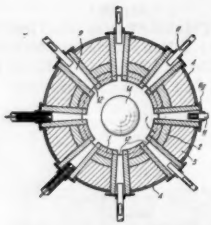
Max Hicguet, Boulogne-Billancourt, France, assignor to Societe D'Etudes Et De Recherches Schentifiques Et Minieres, Seine Saint-Denis, France

Filed Dec. 21, 1972, Ser. No. 317,121

Claims priority, application France, Dec. 23, 1971, 71.46373

Int. Cl. F27b *1/10*

U.S. Cl. 432—19 **8 Claims**



The invention relates to a process and apparatus for heating industrial furnaces wherein liquid fuel oil at a temperature of 250°C. to 500°C. and a pressure of 8 to 50 bars is mixed with a quantity of primary air amounting to 25 to 60 percent of the amount required for complete combustion, and this mixture is subsequently mixed with a quantity of secondary air amounting to 15 to 35 percent of the amount required for complete combustion.

3,816,064

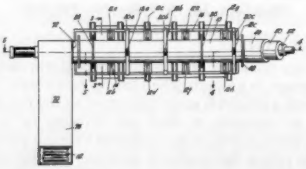
FORGE FURNACE

Sigdon A. Eliot, Worthington, Ohio, assignor to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 83,097, Oct. 22, 1970, abandoned. This application June 15, 1972, Ser. No. 263,251

Int. Cl. F27b *7/14*

U.S. Cl. 432—34 **57 Claims**



This forge furnace has a rotary barrel with means to periodically rotate the barrel and thereby cause the stock therein to roll around.

A vibratory feed mechanism is provided at the material inlet end to move the stock longitudinally when the barrel is not rotating.

Molded refractory inserts are placed in the barrel to provide passageways for the stock and the heating gases.

A stationary compartment with burners that produce a reducing gas mixture is provided at the stock outlet end.

3,816,065

GAS TORCHES

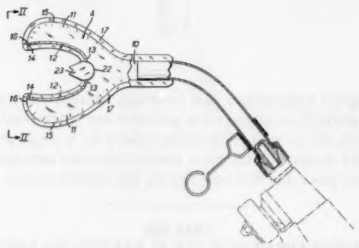
Cesar Marietta, Saint Leu La Foret, France, assignor to Anciens Etablissements Leon Guilbert & Fils, Paris, France

Filed Oct. 30, 1972, Ser. No. 301,803

Claims priority, application France, Feb. 17, 1972, 72.05307

Int. Cl. F23d *13/26*

U.S. Cl. 432—183 **5 Claims**



A gas-flame or hot-gas torch specially designed for uniformly heating the entire periphery of tubes, sections or the like, especially for the purposes of brazing or annealing, in the form of a fork-shaped device comprising a main gas-supply conduit and two lateral arms, with a flame-distributor nozzle incorporated in each of said arms, the latter each having a general curvilinear enveloping shape with an internal wall constituted by the flame distributor nozzle, the extremities of the distributors adjacent to the main gas conduit having a transverse direction with respect to the said conduit, while the extremities of the distributors farthest away from the main gas conduit have a substantially longitudinal direction with respect to the said main conduit, the external walls of said arms, remote from said main conduit, having a substantially transverse direction with respect to the said conduit.

3,816,066

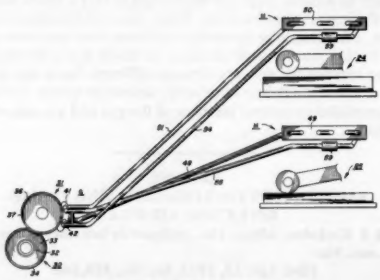
XEROGRAPHIC FIXING DEVICE

Raghulinga R. Thettu, and Haribhajan S. Kocher, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 11, 1973, Ser. No. 369,023

Int. Cl. F28d *15/00*

U.S. Cl. 432—228 **13 Claims**



This invention relates to a xerographic fusing device and, in particular, to apparatus and method for removing excessive heat energy from the surface of a fuser roll utilized in a xerographic image fixing apparatus.

3,816,067

PROCESS FOR PRINTING AND PAD DYEING POLYAMIDE FIBROUS MATERIALS

Gerd Pelster; Volkmar Wurtz, both of Kelkheim/Taunus, and Erich Feess, Lorsbach/Taunos, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation of Ser. No. 23,473, March 27, 1970, abandoned. This application June 15, 1972, Ser. No. 263,157

Claims priority, application Germany, Apr. 1, 1969, 1916627

Int. Cl. D06p *1/38*

U.S. Cl. 8—54 3 Claims

Process for preparing on textile materials consisting of polyamide fibres or of their mixtures with cellulose fibres, or containing such fibres or fibre blends, prints and pad-dyeings having extremely good fastnesses to wet processing, using reactive dyestuffs for printing and padding, and fixing these dyestuffs by steaming at a pH range of from about 6 to 11, preferably of from 7 to 8.5.

3,816,068

FLAME RETARDANT FOR CELLULOSIC FABRICS

Joseph Rivlin, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed July 12, 1971, Ser. No. 161,867

Int. Cl. D06m *13/28*, *15/54*

U.S. Cl. 8—115.7 6 Claims

Flame retardants for cellulosic fabrics, especially polyester blends, comprise a limited phosphine oxide class of N-methylol propionamides, particularly N-methylol-3-(dimethylphosphinyl)propionamide, closely related structurally to N-methylol-3-(dimethyl phosphono)propionamide, but markedly more effective as a flame retardant.

3,816,069

COLORING CELLULOSE TEXTILE MATERIAL WITH A CELLULOSE-REACTIVE DYE

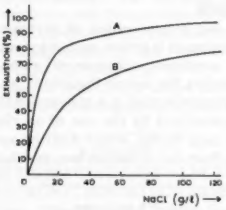
Herbert Francis Andrew; William Lambert Anderson, and William James Marshall, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 11, 1972, Ser. No. 225,435

Claims priority, application Great Britain, Feb. 25, 1971, 5419/71

Int. Cl. D06p *3/66*

U.S. Cl. 8—54.2 2 Claims



A process for colouring cellulose textile materials by impregnating the material with a water-soluble dye containing a cellulose-reactive group and fixing the dye on the material by treatment with an alkali applied in the dyebath or a separate bath in an amount conventionally used for that alkali for fixation of cellulose-reactive dyes, characterised in that the dyestuff used exhibits the following percentage exhaustions at different saline concentrations when dyed on to cotton or viscose rayon for 60 minutes at a strength of 0.5–1.0%, based on the weight of material being dyed, a liquor-to-goods ratio of 20:1 and a temperature of 80° C: g/l sodium chloride 0 20 40 60 80 100 120 exhaustion 0-15 40-80 55-86 65-90 71-94 75-96 78-97

and that the material is subjected after fixation of the dye to at most a rinse in water to wash out loose dyestuff and dyebath additives.

3,816,070

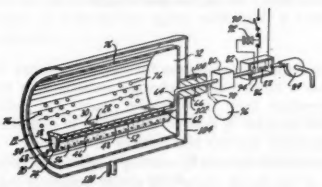
METHOD AND APPARATUS FOR TREATING POROUS MATERIAL WITH FLUID

Robert R. Candor, 5940 Munger Rd., Dayton, Ohio 45459, and James T. Candor, 5440 Cynthia Ln., Dayton, Ohio 45429

Continuation of Ser. No. 788,278, Dec. 31, 1968, abandoned, which is a continuation-in-part of Ser. No. 635,848, May 3, 1967, Pat. No. 3,447,174. This application Jan. 27, 1971, Ser. No. 110,246The portion of the term of this patent subsequent to June 3, 1986, has been disclaimed.

Int. Cl. B08b *3/10*; D06f *25/00*

U.S. Cl. 8—158 2 Claims



This disclosure relates to improved means for treating laundry or the like by tumbling the laundry in a supporting and rotating drum-like member and causing fluid to be forced through the laundry while the same is being compressed between the supporting drum and a nozzle means disposed within the drum, the nozzle means either forcing the fluid from the nozzle means through the compressed laundry or drawing the fluid through the laundry into the nozzle means.

3,816,071

COLORING HYDROPHOBIC FIBERS USING CARRIER OF HALOGENATED HYDROXYBIPHENYLETHER

Kurt A. Dellian, Spring Valley, and Thomas A. Furia, Hartsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1972, Ser. No. 232,191

Int. Cl. D06p *5/04*

U.S. Cl. 8—173 6 Claims

Organic hydrophobic fibers are colored using a disperse or cationic dyestuff employing a carrier component of a halogenated hydroxybiphenylether.

3,816,072

POLYESTER DYEING ASSISTED BY 2-(2,4,6-TRIBROMOPHENOXY)-ETHANOL

Sylvester Bergman, and Richard Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 166,248, July 26, 1971, Pat. No. 3,758,335. This application Feb. 14, 1973, Ser. No. 332,321

Int. Cl. D06p *1/82*, *3/54*

U.S. Cl. 8—173 4 Claims

Polyester, cellulose triacetate, and polyamide fibers are made fire-retardant by contacting with an aqueous dispersion

of 2-(2,4,6-tribromophenoxy)ethanol. This compound also functions as a dye assistant for polyester and cellulose triacetate and can be used in an aqueous dyebath to serve both purposes for those fibers. The treated fibers are resistant to loss of the brominated compound during laundering and dry cleaning processes.

3,816,073

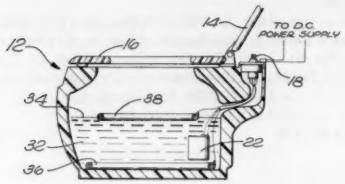
ODOR ELIMINATION SYSTEM

Charles H. Miller, 54065 Avenide Carranza, La Quinta, Calif. 92253

Filed Dec. 1, 1972, Ser. No. 311,194

Int. Cl. E03d 9/02; A61l 13/04

U.S. Cl. 21—102 R **4 Claims**



An odor elimination system for a portable toilet. The toilet comprises a bowl member charged initially with water to a predetermined level and having liquid and solid wastes deposited therein. A pair of electrodes is immersed in the water between the top and bottom of the bowl. The lower electrode can be formed by coating a conductive layer on the bottom of the bowl. Switching means connects the positive terminal of a D.C. voltage source to the lower electrode and the negative terminal to the upper electrode whereby oxygen forms at the bottom electrode and rises to the top of the water, oxidizing odors, bacteria and algae formed in the water.

3,816,074

APPARATUS FOR DISINFECTING AN AREA WITH FORMALDEHYDE

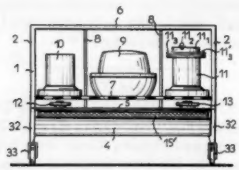
Jean Alexandre Decupper, Cannes, France, assignor to DETEC S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 114,112, Feb. 10, 1971, abandoned. This application June 18, 1973, Ser. No. 370,859

Claims priority, application Switzerland, Feb. 13, 1971, 2092/71

Int. Cl. A61l 3/00

U.S. Cl. 21—110 **2 Claims**



Method and apparatus for disinfecting an area with formaldehyde using a combination of heating the area and adjusting the humidity to certain controlled conditions before releasing the formaldehyde in the area. After a predetermined period the formaldehyde vapour in the area is neutralized with ammonia vapour.

ERRATUM

For Class 23—271 see:
Patent No. 3,816,427

3,816,075

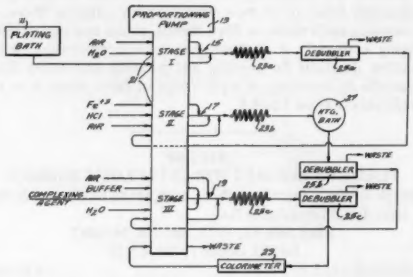
DETERMINATION OF HYPOPHOSPHITE ION CONCENTRATION

Maurice C. Lambert, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Nov. 28, 1972, Ser. No. 310,177

Int. Cl. G01n 31/22

U.S. Cl. 23—230 R **10 Claims**



A sample solution containing hypophosphite and phosphite ions is acidified a sufficient amount to convert most of the phosphite ions to an unreactive form. A solution of ferric ions is combined with the sample and the mixture heated to oxidize the hypophosphite while reducing the ferric to ferrous ions. A complexing agent and a pH buffer are included in the mixture to produce a red colored ferrous complex from which the original concentration of the hypophosphite ion is photometrically determined.

3,816,076

PROCESS FOR THE DETERMINATION OF THYROXINE

Egbert Tobias Backer, Oegstggest, Netherlands, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed June 9, 1972, Ser. No. 261,218

Claims priority, application Germany, June 15, 1971, 2129553

Int. Cl. G01n 33/16

U.S. Cl. 23—230 B **10 Claims**

Method for the determination of thyroxine in biological fluids by adsorption on a cation exchanger, subsequent washing out of the interfering components, eluting the adsorbed thyroxine, liberating the iodine therefrom, and then carrying out the iodine determination in a conventional manner, which process is characterized by the use of an eluent, optionally together with a basic buffer, which destroys amino groups and liberates iodine from the thyroxine into the eluate.

3,816,077

CHLORINE DIOXIDE GENERATING SYSTEM

Willard A. Fuller, Grand Island; Arthur C. Schulz, North Tonawanda, and Herbert J. Rosen, Montrose, all of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

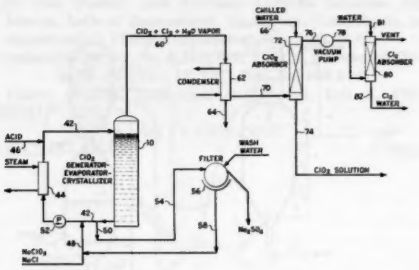
Filed May 21, 1971, Ser. No. 145,669

Int. Cl. B01j 7/02; C01b 11/02

U.S. Cl. 23—260 **11 Claims**

A chlorine dioxide producing system comprising a generator-evaporator-crystallizer reaction tower, a condenser, a

chlorine dioxide absorption tower, vacuum producing means, a chlorine absorption tower and a solid-liquid separator in



communication with the reaction tower provides an extremely efficient chlorine dioxide generation system.

3,816,078

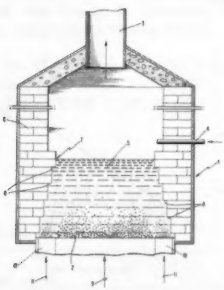
TAPERING FLUIDIZED BED CHAMBER

Clayton C. Cook, Pittsburgh, Pa., and Roy M. Pope, Maryville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 14, 1971, Ser. No. 180,419

Int. Cl. B01j 9/18

U.S. Cl. 23—277 R **2 Claims**



Fluidized bed chamber having a fluidized bed receiving portion therewithin intermediate the fluidizing gas distribution inlet means at the lower end thereof and the gaseous effluent outlet means at the upper end thereof, said receiving portion having a peripherally confining side wall lining slightly inwardly and upwardly tapering, e.g., in steps, in a direction from said inlet means toward said outlet means to minimize the occurrence of unfluidized material adjacent said lining.

3,816,079

METHOD OF PRODUCING GRID ELECTRODES FOR ELECTRONIC DISCHARGE VESSELS

Robert Bachmann, Staretschwil; Charley Buxbaum, Baden, and Benno Zigerlig, Nussbaumen, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Dec. 13, 1972, Ser. No. 314,575

Claims priority, application Switzerland, Dec. 29, 1971, 19037/71

Int. Cl. B22f 7/04

U.S. Cl. 29—182.3 **10 Claims**

A grid electrode for an electronic discharge vessel wherein the wire which forms the grid is first covered with a layer of an intermetallic compound comprising a high-melting metal such as zirconium or titanium and a metal of Group VIII of the Periodic System, for example platinum. The intermetallic compound is applied to the grid wire in powdered form and then sintered after which an outer layer of a noble metal, for example platinum is then applied electrolytically.

3,816,080

MECHANICALLY-ALLOYED ALUMINUM-ALUMINUM OXIDE

Michael James Bomford, and John Stanwood Benjamin, both of Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 160,202, July 6, 1971, Pat. No. 3,740,210. This application Feb. 26, 1973, Ser. No. 335,510

Int. Cl. B22f 9/00

U.S. Cl. 29—182.5 **11 Claims**

A mechanically alloyed composite powder wherein individual particles include an aluminum matrix having equiaxed aluminum oxide dispersoid particles having a size of about 100A to 2,000A uniformly distributed therethrough at particle spacings of about 500 to 3,000A. Products made by consolidating the mechanically alloyed powder exhibit improved strength properties at relatively low dispersoid contents.

A process for producing such mechanically alloyed composite powder including milling under dry conditions and in the presence of a surfactive agent, preferably a volatilizable organic material.

3,816,081

ABRASION RESISTANT CEMENTED TUNGSTEN CARBIDE BONDED WITH Fe-C-Ni-Co

Thomas Eugene Hale, Warren, Mich., assignor to General Electric Company, Detroit, Mich.

Filed Jan. 26, 1973, Ser. No. 327,071

Int. Cl. C22c 1/05, 29/00

U.S. Cl. 29—182.7 **3 Claims**

The use of between 3 percent and 9 percent by weight of an alloy of iron, nickel and cobalt as the bonding agent for fine-particle (1 micron or less) tungsten carbide compact provides a material having enhanced abrasion resistance without incurring significant changes in transverse rupture strength.

3,816,082

METHOD OF IMPROVING THE CORROSION RESISTANCE OF ZINC COATED FERROUS METAL SUBSTRATES AND THE CORROSION RESISTANT SUBSTRATES THUS PRODUCED

Lowell W. Austin, Weirton, W. Va.; Louis C. Beale, Jr., Grosse Ile, Mich., and Edwin J. Smith, Winterville, Ohio, assignors to National Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 818,096, April 21, 1969, abandoned. This application May 22, 1972, Ser. No. 255,420

Int. Cl. B21b

U.S. Cl. 29—183.5 **29 Claims**

The corrosion resistance of zinc coated ferrous metal substrates is increased markedly by electroplating at least a portion of the zinc surface thereof with a coating of metallic chromium having a thickness of about 0.1–0.5 microinch, and thereafter electrochemically treating the resultant metallic chromium coated substrate as a cathode in an aqueous electrolyte containing a water soluble hexavalent chromium compound to deposit a metallic chromium and chromium oxide containing film thereon. In one preferred variant, the zinc surface is brightened prior to the electrodeposition of the metallic chromium coating to thereby increase the brightness of the final product and to render it more pleasing in appearance. The chromium plated and electrochemically treated zinc coated ferrous metal substrate is an excellent base for protec-

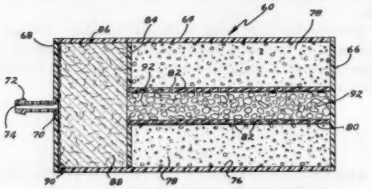
tive organic coatings, and protective organic coatings may be applied thereto to further increase the corrosion resistance and/or for decorative purposes. The method of the invention is easily adapted to high speed electroplating lines operating at strip speeds of at least 500 feet per minute and costs may be reduced substantially. The invention also provides the corrosion resistant substrates prepared by the method of the invention.

3,816,083

ACCESSORY CARTRIDGE FOR IMPROVING INTERNAL COMBUSTION ENGINE EFFICIENCY

Eugene A. Patterson, Minneapolis, Minn., assignor to Patco Products, Inc., Minneapolis, Minn.

Filed Nov. 9, 1972, Ser. No. 305,056
Int. Cl. C10h *19/00;* **F02b** *51/00*
U.S. Cl. 48—59 **14 Claims**



In order to improve the volatilization of the fuel-air mixture supplied by the usual carburetor to the intake manifold of a conventional internal combustion engine, an accessory cartridge is provided containing calcium carbide, naphthalene and sodium sulfate, together with inert materials for inhibiting the flow of fumes generated by the foregoing chemicals. The cartridge is either communicatively connected directly to the intake manifold or between the carburetor and the intake manifold, in either situation having its interior subjected to vacuum conditions that pull the generated fumes or vapors through a cartridge outlet of restricted size directly into the intake manifold. Consequently, the volatilization of the fuel-air delivered by the carburetor is appreciably improved by reason of the fumes from the cartridge. The cartridge is particularly beneficial during cold starting periods and also when abrupt throttle changes are made which interfere with the atomizing and complete vaporization of the fuel by the engine's carburetor and intake manifold.

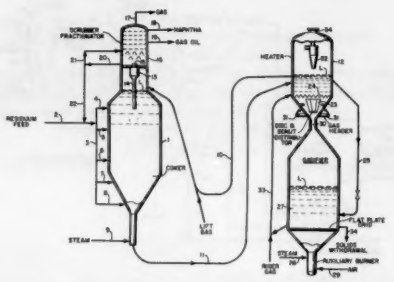
3,816,084

COKELESS COKER WITH RECYCLE OF COKE FROM GASIFIER TO HEATER

John F. Moser, Jr., and William J. Metrailer, both of Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 28,998, April 16, 1970, abandoned. This application May 4, 1972, Ser. No. 250,321
Int. Cl. C10j *3/00;* **C10b** *49/10*
U.S. Cl. 48—206 **17 Claims**

In a fluid coking process in which coke from the coker is passed to a heater and then to a gasifier and in which part of the heat for the heater is supplied by the gases from the gasifier, ungasified coke from the bottom of the gasifier is conveyed through a riser to the heater to supply additional heat and thence back to the coker whereby strength of the coke is increased by fresh coke deposition and in which all the oxygen is injected into the lower gasifier bed thereby eliminating possibility of oxygen breakthrough. The same results can be accomplished by passing the coke from the gasifier directly back to the coke reactor and eliminating the coke stream from the upeer heater bed to the reactor.

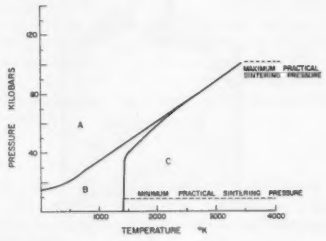


3,816,085

DIAMOND-NONDIAMOND CARBON POLYCRYSTALLINE COMPOSITES

Howard T. Hall, Provo, Utah, assignor to Megadiamond Corporation, Provo, Utah

Filed Jan. 29, 1971, Ser. No. 111,019
Int. Cl. B24d *3/02*
U.S. Cl. 51—307 **3 Claims**



Diamond-nondiamond carbon polycrystalline composites particularly useful as abrasives are made by sintering diamond particles at temperatures above about 1440°K but at pressures below which diamond is stable or metastable with respect to its conversion to graphite.

3,816,086

ABRADING MIXTURE

Richard J. Ceremsak, Hamilton, and Avon H. Hersey, Saugus, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 29, 1971, Ser. No. 184,908
Int. Cl. C09g *1/02, 1/06*
U.S. Cl. 51—308 **3 Claims**

An abrasive mixture for abrading material from the surface of a workpiece is provided with improved cutting characteristics and lower temperature operating capability along with ease of cleaning through the inclusion of solid lubricant particles in the mixture including an inert powder matrix, abrasive particles and sufficient low vapor pressure water miscible liquid binder to provide a paste of a consistency desired for the intended operation. One mixture described includes mica particles as the solid lubricant in a clay powder matrix including abrasive particles such as silicon carbide along with a liquid glycollic compound binder.

3,816,087

METHOD OF INTERCONNECTING GLASS PARTS BY PASSING THROUGH ELECTRIC CURRENT

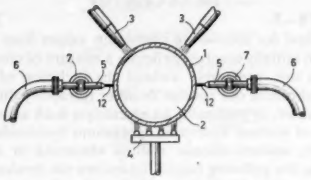
Kars Van Duuren, and Adrianus Cornelis Johannes Verhoeven, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 8,325, Feb. 3, 1970, abandoned. This application Oct. 12, 1971, Ser. No. 188,614

Claims priority, application Netherlands, Feb. 8, 1969, 6902027

Int. Cl. C03b 29/00

U.S. Cl. 65—40 3 Claims



In sealing glass parts to each other by passing electric current through the preheated glass edges, the electric current is supplied to the glass edges via a stream of rare gas.

3,816,088

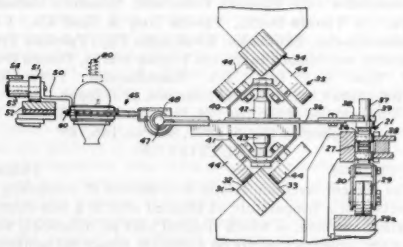
GLASS HEAT TREAT MACHINERY

Louis P. Yakubek, and George R. Obenshain, both of Perrysburg, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 82,987, Oct. 22, 1970. This application Sept. 27, 1972, Ser. No. 292,741

Int. Cl. C03b 23/00, 29/00

U.S. Cl. 65—244 7 Claims



A glass making machine and particularly a heat treat machine wherein open-ended hollow glass articles are supported on carriages moved in an endless path by a conveyor. Each carriage pivotally supports a plurality of heads which, in turn, rotatably support the hollow glass articles. The conveyor moves the carriages and in turn the articles through a plurality of work zones of heat treatment including heating, quenching and cooling zones. In the heat treat zones, manifolds are mounted along the path of the articles and are equipped with burners which impinge flames on the workpiece. A shield means is provided to prevent the flame from direct impingement on the carriage apparatus. As the articles are moved through a work zone, the supports on the heads are rotated to rotate the articles. A hold down pad having a layer of low friction material engages the closed bottom of the inverted article. The hold down pad maintains the article in place during heat treatment.

ERRATUM

For Class 65—30 see:
Patent No. 3,816,107

3,816,089

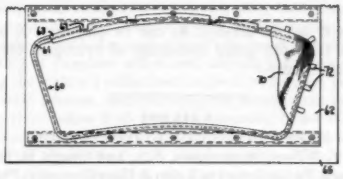
GLASS SHEET PRESS SHAPING APPARATUS

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 77,284, Oct. 1, 1970, Pat. No. 3,717,449. This application Oct. 20, 1972, Ser. No. 299,541

Int. Cl. C03b 23/02

U.S. Cl. 65—273 4 Claims



Press bending heated glass sheets between a solid type-press bending mold and a frame-type press bending mold. The present invention relates to the construction of the frame-type press bending mold forming part of the present invention.

3,816,090

ISOXAZOLOPYRIMIDINE HERBICIDES AND METHOD OF CONTROLLING PLANT GROWTH

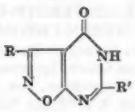
Loren K. Gibbons, Medina, N.Y., assignor to FMC Corporation, New York, N.Y.

Division of Ser. No. 31,414, April 23, 1970, Pat. No. 3,679,682. This application May 15, 1972, Ser. No. 253,646

Int. Cl. A01n 9/22

U.S. Cl. 71—92 18 Claims

Outstanding herbicidal activity is exhibited by the respective members of the group of new isoxazolopyrimidines that are included within the general formula:



wherein R and R′, which may be the same or different, are each members of the group consisting of lower (1–4 carbon atoms)— aliphatic, lower (3–6 carbon atoms)-cycloaliphatic and trifluoro-methyl radicals;
and the metallic and amine salts thereof.

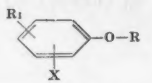
3,816,091

HERBICIDAL ARYL ACETYLENE ETHERS

Alexander Mihailovski, 1812 Delaware St., Berkeley, Calif. 91504, and Ferenc M. Pallos, 3027 Vessing Rd., Pleasant Hill, Calif. 94523

Division of Ser. No. 90,064, Nov. 16, 1970. This application Dec. 8, 1972, Ser. No. 313,376
Int. Cl. A01 *9/24*
U.S. Cl. 71—124 9 Claims

New compounds represented by the following generic formula:



wherein R can be alkynyl; R_1 can be alkynoxy; X can be selected from the group consisting of hydrogen, alkyl, alkynoxy or halogen.

3,816,092

HERBICIDAL 3,1-DICHLOROANILIDES

Harold F. Wilson, Moorestown, N.J., and Dougal H. McRay, Hatboro, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Division of Ser. No. 31,253, May 24, 1960, abandoned, which is a continuation-in-part of Ser. No. 714,947, Feb. 13, 1958, abandoned. This application Mar. 16, 1961, Ser. No. 96,089
Int. Cl. A01n *9/20*
U.S. Cl. 71—118 12 Claims

Disclosed is a method for selectively inhibiting growth of undesirable plants in an area containing growing undesirable plants in an established crop, which comprises applying to said area 3,4-dichloropropionanilide at a rate of application which inhibits growth of said undesirable plants and which does not adversely affect the growth of said established crop.

3,816,093

HALOGENATING METHOD OF REDUCING IRON AND TITANIUM CONTENT OF ALUMINA-SILICA ORE

Clarence L. Hildreth, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 41,610, May 28, 1970, abandoned. This application May 11, 1972, Ser. No. 252,214
Int. Cl. C22b *1/08*, *1/02*
U.S. Cl. 75—1 5 Claims

A method of beneficiating or upgrading aluminum-silicate or alumina-silica ores, especially clays containing substantial amounts of minerals such as kyanite, diaspore and the like, wherein the ore is heated in a non-fluidized bed to a relatively high temperature in the presence of a carbonaceous reducing agent and treated with chlorine and/or bromine.

3,816,094

METHOD FOR THE CONVERSION OF CHROMITE ORE TO SODIUM CHROMATE

William Wayne Low, Syracuse; Douglas Gene Frick, Liverpool, and Alan Brian Gancy, Syracuse, all of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 9, 1972, Ser. No. 233,128
Int. Cl. C22b *1/24*
U.S. Cl. 75—3 13 Claims

A method of producing sodium chromate from chromite ore which involves mixing the ore with sodium carbonate and a refractory diluent, pelleting the mixture at a temperature of at least 36° C. using a pelleting liquid which may be water or water containing dissolved substances, drying and roasting the pellets under oxidizing conditions, then disintegrating and extracting the pellets to obtain an aqueous solution of sodium chromate.

The practice of pelleting the mix at a temperature at least above that at which sodium carbonate decahydrate normally forms, provides pellets of improved strength to withstand handling and roasting in a furnace.

3,816,095

METHOD FOR RECOVERING CHROMIUM VALUES FROM CHROMITE ORE

Charles Patrick Bruen, Bernardsville, N.J.; William Wayne Low, Syracuse, and Edmund Walter Smalley, Brewerton, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 9, 1972, Ser. No. 233,286
Int. Cl. C22b *1/24*
U.S. Cl. 75—3 20 Claims

A method for recovering chromium values from chromite ore which initially involves pelleting a mixture of chromite ore and soda ash, preferably without the inclusion of recycled leached chromite ore residue or other refractory diluent, employing water, or preferably an electrolyte such as an aqueous solution of sodium hydroxide, potassium hydroxide, sodium aluminate, sodium silicate, sodium chromate or a mixture thereof as the pelleting liquid. To reduce the tendency of the pellets to melt and fuse during the roasting step, the chromite ore is heated under oxidizing conditions, either before or after being incorporated into the pellets, to an extent sufficient to oxidize at least 40% of the contained ferrous oxide to the ferric state. The pellets are next roasted under oxidizing conditions, preferably in a static bed, then disintegrated and extracted to obtain an aqueous solution of the soluble sodium chromate thus formed.

3,816,096

METHOD OF CONTROLLING A SINTERING PROCESS HAVING A COOLING ZONE

Keiji Tsujihata, 21-7, 2-chome, Nishiogi-kita, Suginami-ku, Tokyo; Yasuhiro Sawada, 26, 3-chome, Sakae-cho, Euchu City, Tokyo; Yasushi Ishikawa, c/o Yawata-Works, Yawata Iron & Steel Co., Ltd., 1-1, Edamitsu-cho, Yawata-ku, Kitakyushu City, Fukuoka Prefecture; Mitsuteru Matsubara, c/o Yawata-Works, Yawata Iron & Steel Co., 1-1, Edamitsu-cho, Yawata-ku, Kitakyushu City, Fukuoka Prefecture, and Minoru Iwata, c/o Yawata-Works, Yawata Iron & Steel Co., Ltd., 1-1, Edamitsu-cho, Yawata-ku, Kitakyushu City, Fukuoka Prefecture, all of Japan

Continuation of Ser. No. 701,350, Jan. 29, 1968. This application Oct. 5, 1971, Ser. No. 186,759
Int. Cl. C21b *1/10*
U.S. Cl. 75—5 1 Claim

The present invention relates to a method of controlling a reduction in a temperature of sintered ores in a belt-shaped sintering machine, in which sintered ores as completely sintered are cooled as they are on a pallet to reduce the temperature of said sintered ores so as to have cracks in the sintered layer in the vertical direction in the final period of the cooling.

3,816,097

POWDERS OF METAL, SILVER AND GOLD

Valdis R. Daiga, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

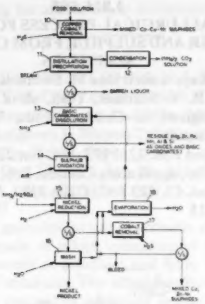
Division of Ser. No. 141,006, May 6, 1971, Pat. No. 3,717,453. This application June 8, 1972, Ser. No. 261,079
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 A 9 Claims

A substantially homogeneous, finely divided powder, substantially free of silver chloride or cyanide comprising at least one metal other than silver or gold, and silver and gold, and an anti-agglomerating agent substantially homogeneously dispersed throughout said powder. The powders are particularly useful in the electronic arts.

3,816,098
PRODUCTION OF NICKEL POWDER FROM IMPURE NICKEL COMPOUNDS

Vladimir N. Mackiw, Islington, Ontario; Donald R. Weir, Fort Saskatchewan, Alberta; David J. I. Evans, North Edmonton, and Dennis G. Maschmeyer, Fort Saskatchewan, Alberta, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed Dec. 5, 1972, Ser. No. 312,299
Claims priority, application Canada, Oct. 20, 1972, 154623
Int. Cl. C22b *23/04*
U.S. Cl. 75—.5 A **10 Claims**



According to the invention, substantially pure, particulate elemental nickel is recovered from nickel compounds and particularly from basic nickel carbonate, which are soluble in aqueous ammoniacal ammonium sulphate solution and which contain impurities including particularly zinc, manganese and/or magnesium by first extracting substantially all the nickel content from the impure nickel compound by dissolving it in an aqueous ammoniacal ammonium sulphate solution containing ammonium sulphate in excess of the stoichiometric amount required to react with the nickel to form nickel diammine sulphate. The resulting nickel diammine sulphate solution is separated from undissolved residue and is reacted with hydrogen at elevated temperature and pressure to reduce dissolved nickel to elemental form and to precipitate it in powder form. Nickel-depleted solution, referred to as "reduction end solution," containing zinc, manganese and/or magnesium as well as small amounts of other impurities as dissolved sulphates is recycled to the nickel compound dissolution step and the quantity of such solution recycled is controlled such that the impurities' level in the reduction end solution is maintained at a predetermined level above the level that would result if no solution were recycled but below that level at which zinc, manganese and/or magnesium report in the nickel powder product in sufficient quantity to contaminate the product. The portion of the reduction end solution which is not recycled is bled from the process circuit.

3,816,099
PROCESS FOR PRODUCING METALLIC IRON CONCENTRATES AND TITANIUM OXIDE CONCENTRATES FROM TITANIFEROUS ORES

Donald Fergusson Stewart, Doncaster, Victoria, and Leslie John Pollard, Lower Templestow, Victoria, both of Australia, assignors to ICI Australia Limited, Melbourne, Victoria, Australia

Filed Feb. 22, 1972, Ser. No. 228,315
Claims priority, application Australia, Mar. 1, 1971, 4156/71; Mar. 1, 1971, 4157/71; Mar. 1, 1971, 4158/71; Mar. 1, 1971, 3159/71
Int. Cl. C21b *1/00*; **C22b** *5/10*
U.S. Cl. 75—1 **4 Claims**

A process of producing metallic iron concentrate and titanium oxide concentrates from titaniferous ores which process comprises mixing the ore with flux and reducing the mixture with solid carbonaceous material without sintering or melting. The reduced material may be separated into metallic iron and titanium oxide concentrates by physical means.

3,816,100
METHOD FOR PRODUCING ALLOY STEEL

Sundaresan Ramachandran; James C. Fulton, both of Natrona Heights, and Harry L. Bishop, Jr., Pittsburgh, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

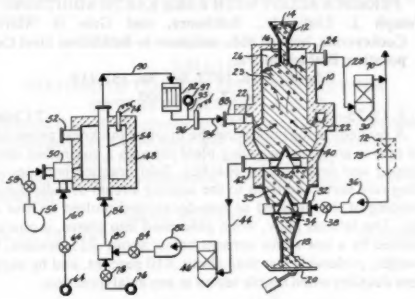
Filed Sept. 29, 1970, Ser. No. 76,592
Int. Cl. C21c *5/52*, *7/10*
U.S. Cl. 75—12 **20 Claims**

An improved method for producing alloy steel, comprising the steps of: charging a furnace with materials comprised of iron, carbon and sulfur, and at least one metal from the group consisting of cromium and nickel; melting the charge; desulfurizing the melt to a sulfur level below 0.04 percent, generally below 0.03 percent; decarburizing the desulfurized melt to a carbon level below 0.15 percent, generally below 0.07 percent; deoxidizing the melt; and casting the melt. In addition the method often includes the additional step of finally adjusting the alloy composition for certain elements, such as chromium, prior to decarburizing.

3,816,101
METHOD FOR REDUCING IRON OXIDES IN A GASEOUS REDUCTION PROCESS

Donald Beggs, Toledo, and William T. Marston, Whitehouse, both of Ohio, assignors to Midrex Corporation, Toledo, Ohio

Filed Dec. 10, 1969, Ser. No. 883,889
Int. Cl. C21b *13/02*
U.S. Cl. 75—35 **3 Claims**



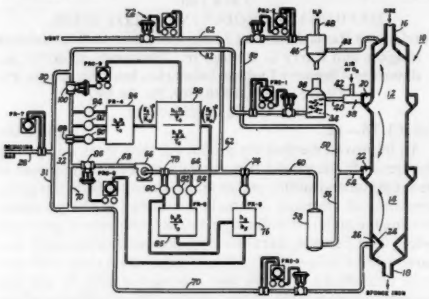
This is a disclosure of a method and apparatus for reducing iron oxides to metallized pellets and includes the desulphurization of gases containing sulphur and/or compounds of sulphur, especially H_2S. The disclosure is particularly concerned with the metallization of iron oxides through a gaseous reduction process wherein the spent gas is used to cool the pellets before discharge from the furnace, and then is upgraded for continued use. It has also been found that activated iron particles, such as sponge iron and metallized pellets, are highly effective for the removal of sulphur impurities from such gas.

3,816,102

METHOD AND APPARATUS FOR REDUCING PARTICULATE METAL ORES TO SPONGE METAL AND COOLING THE REDUCED METAL

Juan Celada; Patrick W. Mackay, and Enrique R. Martinez, all of Monterrey, Mexico, assignors to Fierro Esponja S.A., Monterrey, N.L. Mexico

Filed Nov. 26, 1971, Ser. No. 202,411
Int. Cl. C21b *13/00*; F27b *5/16*
U.S. Cl. 75—35 **17 Claims**



A method and apparatus are disclosed for achieving improved reduction efficiency in the reduction of particulate metal ores, e.g., iron ore, in a vertical shaft, moving bed reactor having a reduction zone in which a hot reducing gas is caused to flow through a portion of the ore bed to reduce the metal ore thereof to metal, e.g., sponge iron, and a cooling zone in which a gaseous coolant is caused to flow through the reduced metal to cool it. Both the reducing gas and cooling gas are recycled to the reactor in loops that are interconnected and a split flow of reducing gas in the reduction zone is used. Make-up reducing gas is supplied to the interconnected loops and depleted reducing gas is vented therefrom. A method and apparatus for controlling gas flow in the several loops of the reduction system are also disclosed.

3,816,103

METHOD OF DEOXIDIZING AND DESULFURIZING FERROUS ALLOY WITH RARE EARTH ADDITIONS

Joseph J. Link, Jr., Baltimore, and Gale D. Marsh, Cockeysville, both of Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 16, 1973, Ser. No. 351,419
Int. Cl. C21c *7/00*
U.S. Cl. 75—53 **7 Claims**

A procedure for improving the through thickness properties of coarse grain ferrous alloy plate through a controlled deoxidizing and desulfurizing practice. Said practice includes adding rare earth additions to the tapping stream or ladle during tapping of the unkilled or non-deoxidized molten ferrous alloy. The ferrous alloy, when processed into plates, is characterized by a low sulfur content below about .015 percent, by weight, preferably less than about .010 percent, and by excellent ductility when tensile tested in any axial direction.

3,816,104

DEOXIDIZING NICKEL BASE AND COBALT BASE ALLOYS

Sundaresan Ramachandran, Ranchi, India, assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 75,738, Sept. 25, 1970, Pat. No. 3,725,041. This application Nov. 24, 1972, Ser. No. 307,661The portion of the term of this patent subsequent to Apr. 3, 1990, has been disclaimed.
Int. Cl. C22b *23/00*
U.S. Cl. 75—82 **10 Claims**

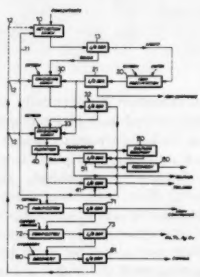
A method of deoxidizing metal while maintaining the carbon content of the metal at a level about equal to or lower than the level prior to deoxidizing. It comprises the steps of introducing hydrocarbon deoxidizer and diluent gas into a vessel containing molten metal, determining the effect of the hydrocarbon deoxidizer and diluent gas upon the carbon content of the metal and controlling the proportion of hydrocarbon deoxidizer to diluent gas so that the average rate of carbon leaving the vessel is about equal to or greater than the average rate of carbon being introduced into the vessel.

3,816,105

HYDROMETALLURGICAL PROCESS FOR EXTRACTION OF COPPER AND SULPHUR FROM COPPER IRON SULPHIDES

Donald R. McKay; Godefridus M. Swinkels, both of Rossland, and Kornel R. V. Szarmes, Trail, all of British Columbia, Canada, assignors to Cominco Ltd., Vancouver, British Columbia, Canada

Filed Feb. 22, 1972, Ser. No. 227,950
Claims priority, application Canada, Feb. 19, 1971, 105999
Int. Cl. 423 *567*; C22b *3/00*, *15/08*
U.S. Cl. 75—115 **24 Claims**



A process for the hydrometallurigical extraction of copper values and sulphur in elemental form from copper-iron sulphides in which the sulphides are subjected to an activation leach with an acidic copper sulphate solution whereby insoluble simple copper sulphides and a solution of ferrous sulphate are obtained. After a liquid-solids separation, for the effective separation of iron from copper values, the ferrous sulphate in the solution is oxidized and hydrolyzed to precipitate the iron, which is removed from the process, and to regenerate acid solution containing sulphuric acid. The copper sulphides are treated with an oxygen-bearing gas and with said regenerated sulphuric acid solution in a multiple-stage oxidizing leach to oxidize the sulphide sulphur to elemental sulphur and to liberate the copper as cupric ion for subsequent recovery in metallic form.

3,816,106

STRONG, CORROSION RESISTANT ALLOY

Edwin Snape, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Aug. 25, 1972, Ser. No. 283,810
Int. Cl. C22c *39/00*, *39/20*
U.S. Cl. 75—122 **4 Claims**

Alloys containing special percentages of chromium, nickel, cobalt, carbon, iron, etc., are highly corrosion resistant and in the cold-worked condition, afford tensile strengths well above 150,000 psi.

3,816,107

METHOD OF INCREASING CHEMICAL DURABILITY OF GLASS

Charles E. Searight; John R. Ryan, and Steven H. Brasfield, all of Jackson, Miss., assignors to Cataphote Corporation, Jackson, Miss.

Continuation-in-part of Ser. No. 117,160, Feb. 19, 1971, abandoned. This application Feb. 14, 1973, Ser. No. 332,418

Int. Cl. C03c *17/10*

U.S. Cl. 65—30 11 Claims

A process for improving the chemical durability of glass products involves contacting a glass surface with an aqueous alcoholic solution of a soluble aluminum containing salt and thereafter oxidizing the aluminum to aluminum oxide.

3,816,108

SEMICONDUCTOR GRANULES FOR USE IN ACOUSTIC-ELECTRO CONVERTING DEVICES

Toru Takagi; Osamu Ochi, and Yoshihiko Mizushima, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Dec. 22, 1971, Ser. No. 210,800

Int. Cl. C22c *31/00*

U.S. Cl. 75—134 H 7 Claims

Semiconductor granules for use in acoustic-electro converting devices are made of alloys consisting of from 10 to 95 atomic weight percent of selenium and from 5 to 90 atomic weight percent of tellurium. The alloy may contain from 1 to 80 atomic weight percent of antimony or lead. The granules are packed in a chamber defined between a moving electrode supported by a diaphragm and a fixed electrode of an acoustic-electro converting device.

3,816,109

COPPER BASE ALLOY

Jacob Crane; Sam Friedman, both of Hamden, and Michael J. Pryor, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed July 3, 1972, Ser. No. 268,485

Int. Cl. C22c *9/06, 9/04*

U.S. Cl. 75—157.5 6 Claims

A copper base alloy having a combination of strength and electrical conductivity which make it a suitable replacement for the C.D.A. 400 series tin brasses. The alloy contains from about 0.5 to about 2.8 percent iron and, preferably, from about 1.0 to about 2.0 percent iron; from about 0.2 to about 2.0 percent cobalt and, preferably, from about 0.3 to about 1.0% cobalt; from about 5 to about 15 percent zinc and, preferably, from about 7 to about 13 percent zinc; provided that the sum of the iron plus cobalt should be from about 0.8 to about 3.0 percent and, preferably, from about 1.5 to about 2.5 percent.

3,816,110

HEAT-RESISTANT AND CORROSION-RESISTANT HIGH CHROMIUM-NICKEL ALLOY

Kazumi Shimotori; Hirokazu Tokoro, both of Kawasaki; Shinichi Nakamura, and Katsuhiko Kawakita, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-Shi, Japan

Filed Apr. 10, 1972, Ser. No. 242,799

Claims priority, application Japan, Apr. 15, 1971, 46-23479

Int. Cl. C22c *19/00*

U.S. Cl. 75—171 1 Claim

A heat-resistant and corrosion-resistant high chromium-nickel alloy, consisting of 32 to 40 percent by weight chromium, 2 to 9 percent by weight tantalum, 2 to 5 percent by weight molybdenum, 0.5 to 3 percent by weight (aluminum + titanium), 0.05 to 0.5 percent by weight carbon, 0.025 to 0.35 percent by weight boron, with the remainder being substantially nickel and incidental impurities is provided.

This alloy is not only characterized by excellent heat-resistant properties and excellent corrosion-resistance, but is also characterized by very great mechanical strength properties at elevated temperatures, and has good high temperature workability so that it can be formed by hot forging techniques. Hence, this alloy is suitable for the construction of parts which require great mechanical strength properties at elevated temperatures, such as gas turbine blades which operate under low grade residual fuel oil combustion.

3,816,111

CHROMIUM-BASE ALLOY FOR MAKING A CHILL-MOLD AND A PROCESS OF MAKING SAME

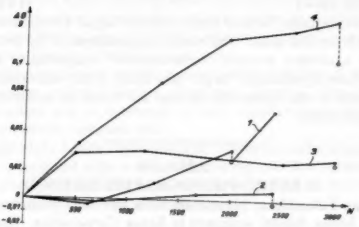
Hans Schneider, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 11, 1972, Ser. No. 252,256

Claims priority, application Switzerland, May 12, 1971, 7002/71; Apr. 25, 1972, 6099/72

Int. Cl. C22c *27/00*; B29c *1/02*

U.S. Cl. 75—176 3 Claims



The chromium-based alloy is used for making a chill mold for high temperatures, i.e. up to 1550°C, melts. The alloy contains 15 to 35 percent cobalt and/or iron, 0 to 0.2 percent nitrogen, stochiometric quantities relative to the nitrogen of a nitride-former selected from titanium, hafnium and zirconium, and the remainder chromium up to 64 percent. The alloy has good heat conductivity, a small heat-expansion coefficient, good resistance to corrosion and a sufficient heat resistance.

3,816,112

METHOD OF COATING STEEL PLATES WITH SINTERED FRICTION LAYERS

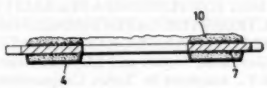
Friedrich Heck, Deilinghofen-Brockhausen, Germany, assignor to Duria-Werk Karl Kempf KG, Neuss/Rhein, Germany

Filed Nov. 5, 1971, Ser. No. 196,094

Claims priority, application Germany, Nov. 5, 1970, 2054335

Int. Cl. B22f *5/00, 7/02*

U.S. Cl. 75—208 R 14 Claims



Method of coating a steel plate having upper and lower surfaces with layers of sintered friction material on both surfaces. The method comprises the following steps:

a. adhering a layer having a rough, intermeshing surface on one of said upper and lower surfaces;

b. placing the steel plate with said layer pointing downwardly onto a mold having a mold cavity filled with

particles of friction material so that said layer contacts the uppermost of said particles;

c. applying, in loose formation, a layer of particles of friction material on the other one of said surfaces;

d. jointly sintering said particles of friction material within said mold cavity and on said other one of said surfaces to form first and second coatings of sintered material on said surfaces;

e. removing said mold; and

f. jointly compressing said first and second coatings to a desired thickness.

3,816,113

NEMATIC LIQUID CRYSTALLINE COMPOSITIONS HAVING EXTENDED MESOMORPHIC RANGE

Werner E. L. Haas; John B. Flannery, Jr., both of Webster; Bela Mechlowitz, Rochester, and James E. Adams, East Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 13, 1971, Ser. No. 179,731

Int. Cl. G03g *13/10, 9/04;* **G02f** *1/28, 1/36;* **G03b** *21/24;* **350** *160 LC*

U.S. Cl. 96—1 **11 Claims**

Compositions formed from nematic liquid crystalline compounds are disclosed. The novel compositions of the invention have extended nematic mesomorphic temperature ranges which are significantly larger than those of the individual components of the compositions and are stable at relatively low temperatures.

3,816,114

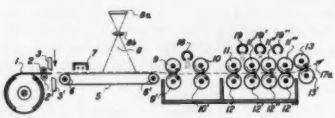
ELECTRO-PHOTOGRAPHIC METHOD

Osamu Fukushima; Masamichi Sato, and Seiji Matsumoto, all of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 13, 1972, Ser. No. 234,287

Int. Cl. G03g *13/10, 15/10*

U.S. Cl. 96—1 LY **2 Claims**



Development of an electrostatic latent image on an image carrier with liquid electrophoretic developer and utilizing a closely spaced development electrode, is facilitated by embossing the side edges of the carrier with embossments that project above the image surface of the carrier. These embossments are used to establish and maintain a fixed spacing between the electrode and the image surface.

3,816,115

METHOD FOR FORMING A PLURALITY OF ELECTROSTATIC LATENT IMAGES ON AN ELECTROPHOTOGRAPHIC PLATE

Robert W. Gundlach, Victor, and Lloyd F. Bean, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 50,216, June 26, 1970, abandoned. This application Aug. 25, 1971, Ser. No. 174,830

Int. Cl. G03g *13/22*

U.S. Cl. 96—1.4 **17 Claims**

A plurality of electrostatic latent images are formed on the surface of an electrophotographic plate having an electrically insulating overcoating by a method comprising the steps of charging the plate to a uniform surface potential, exposing to a first image pattern, recharging the plate to restore the uniform surface potential and subsequently exposing to a second image pattern. The latent images can be developed with an electroscopic marking material to form visible powder images which can be fixed to the plate or transferred to a recording medium and fixed thereon.

3,816,116

N-TYPE PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY

Hideyo Kondo, Tone-machi; Tatsuo Masaki, and Nobuo Kitajima, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1971, Ser. No. 211,274

Claims priority, application Japan, Dec. 29, 1970, 45-129134

Int. Cl. G03g *5/00*

U.S. Cl. 96—1.5 **2 Claims**

A photosensitive layer for electrophotography is composed of Se-Te alloy containing less than 3 percent by weight of Te and the Te is in a form of selenium-tellurium bond, and the Se-Te alloy has a polarity of N-type.

3,816,117

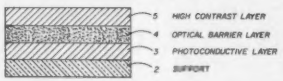
MULTILAYER ELECTROPHOTOGRAPHIC ELEMENT CONTAINING HIGH CONTRAST AND OPAQUE BARRIER LAYERS

Joseph Y. Kaukeinen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 25, 1972, Ser. No. 292,033

Int. Cl. G03g *5/04, 5/06*

U.S. Cl. 96—1.5 **17 Claims**



A multilayer electrophotographic element is disclosed containing a photoconductive layer, an opaque optical barrier layer, and a high contrast layer. The element is suitable for use, e.g., in a display screen device, where high contrast, high density images are desired. An electrostatic image carried on the element may be processed under normal room lighting conditions.

3,816,118

ELECTROPHOTOGRAPHIC ELEMENT CONTAINING PHTHALOCYANINE

John F. Byrne, Worthington, Ohio, assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 375,191, June 15, 1964, abandoned. This application Jan. 3, 1966, Ser. No. 518,450

Int. Cl. G03g *5/06*

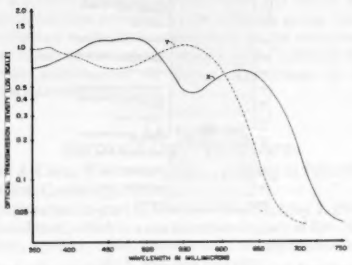
U.S. Cl. 96—1.5 **27 Claims**

An electrophotographic plate comprising phthalocyanine pigment dispersed in a binder material is disclosed. Methods of preparing and using said plate in electrophotographic processes are also disclosed.

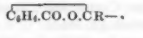
3,816,119
PHOTOGRAPHIC PROCESSES AND PRODUCTS EMPLOYING CARBAZOLE PHTHALEINS AS OPTICAL FILTER AGENTS

Ruth C. Bilofsky, Arlington, Mass., and Richard D. Cramer, Moylan, Pa., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 26, 1971, Ser. No. 202,482
Int. Cl. G03c *7/100, 5/30, 5/54, 1/40, 1/84*
U.S. Cl. 96—3 **49 Claims**



This invention relates to a new class of indicator dyes useful as optical filter agents in photographic processes to protect a selectively exposed photosensitive material from further exposure during processing in the presence of incident light. Such dyes comprise 3,6-disubstituted carbazoles wherein the 3,6 substituents are selected from a phthalidyl radical,



wherein R is an aryl group and an o-carboxy-benzoyl radical, not more than one of said substituents being o-carboxybenzoyl.

3,816,120
PHOTOGRAPHIC PROCESSES AND PRODUCTS EMPLOYING MIXED INDOLE CARBAZOLE PHTHALEINS AS OPTICAL FILTER AGENTS

Paul S. Huyffer, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 26, 1971, Ser. No. 202,555
Int. Cl. G03c *7/00, 5/54, 5/30, 1/48, 1/40, 1/84*
U.S. Cl. 96—3 **37 Claims**

This invention relates to a class of phthalein indicator dyes useful as optical filter agents in photographic processes to protect a selectively exposed photosensitive material from further exposure during processing in the presence of incident light. Such dyes comprise 3,3-disubstituted phthalides and 3,3-disubstituted naphthalides wherein one of said 3,3 substituents is a carbazol-3-yl radical and the other is an indol-3-yl radical possessing a hydrogen-bonding group substituted on a carbon atom adjacent to the heterocyclic N atom, both of said carbazolyl and indolyl radicals having hydrogen substituted on the heterocyclic N atom.

3,816,121
DIRECT POSITIVE PHOTOGRAPHIC MATERIAL CONTAINING A COLOR COUPLER UNDER ONE MICRON IN SIZE AND FOGGED SILVER HALIDE GRAINS WITH SUBSTANTIALLY NO INTERNAL SENSITIVITY HAVING ABSORBED ON THE SURFACE A DESENSITIZING DYE CONTAINING A SOLUBILIZING GROUP

Keisuke Shiba; Hiroyuki Amano; Hirozo Ueda, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 5, 1972, Ser. No. 286,395
Claims priority, application Japan, Sept. 4, 1971, 46-68250
Int. Cl. G03c *1/10, 1/36, 1/28*
U.S. Cl. 96—97 **17 Claims**

A color photographic material having at least one silver halide photographic emulsion layer containing chemically fogged direct positive silver halide grains, said silver halide photographic emulsion layer simultaneously satisfying the following criteria:

1. said silver halide photographic emulsion having substantially no free electron trap in said silver halide grains;
2. said silver halide photographic emulsion having adsorbed on the surface of said silver halide grains an electron acceptor having a water-soluble anionic group or an anionic group forming a betaine structure;
3. said silver halide emulsion containing droplets of an oil-soluble color coupler dispersed therein, the mean droplets size in diameter of said coupler being smaller than about 1 micron; and
4. said silver halide emulsion layer forming a color image on development with a color developing solution containing a phenylenediamine or a derivative thereof as the color developing agent is disclosed.

3,816,122
FILM ELEMENT COMPRISING AROMATIC DIESTER CONTAINING COPOLYESTER SUPPORT

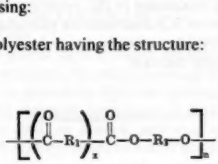
Frederick L. Hamb, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 222,977, Feb. 2, 1972, Pat. No. 3,772,405.
This application June 25, 1973, Ser. No. 373,076
Int. Cl. G03c *1/02, 1/76*
U.S. Cl. 96—87 R **9 Claims**

A second polyester is prepared from a first polyester by a process comprising:

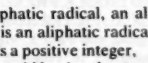
A. mixing:

1. a first polyester having the structure:



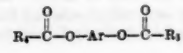
wherein R_1 is an aliphatic radical, an alicyclic radical or an aromatic radical, R_2 is an aliphatic radical or an alicyclic radical, x is 0 or 1 and n is a positive integer,

2. a dicarboxylic acid having the structure:



wherein R_3 is an aliphatic radical, an alicyclic radical or an aromatic radical, and

3. an aromatic diester having the structure:



wherein R_4 and R_5 are radicals independently selected from the group consisting of alkyl radicals, cycloalkyl radicals, and aryl radicals and Ar is an arylene radical;

B. heating the mixture to form a melt; and

C. removing the non-polymeric by-products of the reaction whereby the reaction equilibrium is driven in the direction of polymer formation and the second polyester is obtained; said second polyester is utilized as supports in photographic elements.

3,816,123

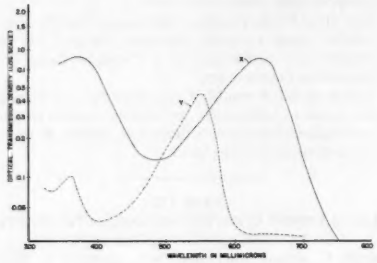
PHOTOGRAPHIC PROCESSES AND PRODUCTS EMPLOYING 8-QUINOLINOL PHTHALEINS AS OPTICAL FILTER AGENTS

Alan L. Borror, and Paulina P. Garcia, both of Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 26, 1971, Ser. No. 202,483

Int. Cl. G03c *7/00, 5/54, 5/30, 1/48, 1/40, 1/84*

U.S. Cl. 96—3 **37 Claims**



This invention relates to a class of phthalein indicator dyes useful as optical filter agents in photographic processes to protect a selectively exposed photosensitive material from further exposure during processing in the presence of incident light. Such dyes comprise 3,3-disubstituted phthalides and 3,3-disubstituted naphthalides wherein the 3,3 substituents are 8′-hydroxy-5′-quinolyl radicals.

3,816,124

PHOTOGRAPHIC PROCESSES AND PRODUCTS EMPLOYING MIXED INDOLE/PHENOL PHTHALEINS AS OPTICAL FILTER AGENTS

Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 26, 1971, Ser. No. 202,558

Int. Cl. G03c *7/00, 5/54, 5/30, 1/48, 1/40, 1/84*

U.S. Cl. 96—3 **44 Claims**

This invention relates to a class of indicator dyes useful as optical filter agents in photographic processes to protect a selectively exposed photosensitive material from further exposure during processing in the presence of incident light. Such dyes comprise 3,3-disubstituted phthalides and 3,3-disubstituted naphthalides wherein one of the 3,3-substituents is an indol-3-yl radical substituted with hydrogen on the heterocyclic N atom and the other of said 3,3 substituents is a p-hydroxycarbocyclic aryl radical selected from a 4′-hydroxy-1′-phenyl radical and a 4′-hydroxy-1′-naphthyl radical.

3,816,125

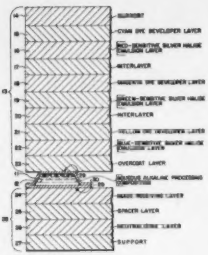
PHOTOGRAPHIC PRODUCTS AND PROCESSES

John R. Demember, North Reading; Howard C. Haas, Arlington, and Jerome L. Reid, Wayland, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 16, 1972, Ser. No. 263,539

Int. Cl. G03c *7/00, 5/54, 1/40, 1/10*

U.S. Cl. 96—3 **27 Claims**



The present invention is directed to photography and particularly to diffusion transfer color processes wherein the color separation and highlights are significantly enhanced by carrying out said process in the presence of an onium salt of a polymeric anion.

3,816,126

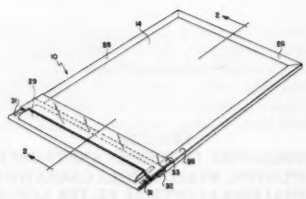
NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

John C. Charkoudian, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 11, 1972, Ser. No. 287,629

Int. Cl. G03c *7/00, 5/54, 5/30, 1/48, 1/40*

U.S. Cl. 96—3 **22 Claims**



The present invention is directed to a photographic film unit adapted to provide, by diffusion transfer processing, selective dye image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which film unit includes a plurality of layers including a photosensitive silver halide layer having associated therewith diffusion transfer process dye image-forming material; and a silver halide developing agent selected from the group consisting of 2,6-di-t-butyl hydroquinone; 2,5-di-t-butyl hydroquinone; durohydroquinone; and the precursors thereof, and a layer adapted to receive dye image-forming material diffusing thereto; and to specified diffusion transfer processes employing such film units.

3,816,127

NOVEL IMAGING SYSTEMS CONTAINING OPTICALLY ACTIVE POLYSULFOXIDE GROUPS

Howard C. Haas, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 12, 1972, Ser. No. 270,973

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 R **9 Claims**

An imaging system wherein an image is formed in terms of optical rotation which comprises exposing a photo-sensitive silver halide emulsion, contacting the exposed emulsion with a layer comprising an optically active polymeric sulfoxide and developing the latent image in the emulsion with a reagent which is a silver halide developing agent and which destroys the optical rotation provided by the sulfoxide group. An image is thus formed in the layer superposed on the emulsion layer by destruction of the optical rotation of the sulfoxide by contact with unexhausted developer. The image is viewed between rotatable polarizers.

3,816,128

PHOTOGRAPHIC FILM UNIT

Richard J. Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 726,252, May 2, 1968, abandoned, which is a continuation-in-part of Ser. No. 721,231, April 15, 1968, abandoned. This application Apr. 2, 1971, Ser. No. 130,609

Int. Cl. G03c *1/48*

U.S. Cl. 96—76 C **15 Claims**

A self-developing photographic film unit adapted to be processed by a viscous liquid processing composition distributed within the film unit from the leading end toward the trailing end by movement of the film unit between a pair of pressure-applying members. The film unit includes a photosensitive sheet having a trailing end section, a transparent second sheet having a trailing end section, located in face-to-face relation with the photosensitive sheet and a retaining sheet engaged around and secured to the trailing end sections of the photosensitive and second sheets. The film unit is designed to remain intact following image formation in the region between sheets and a spacing element, which may be generally comb-shaped, is secured between the retaining sheet and the surfaces of the trailing end sections of the sheets to provide liquid trapping spaces located externally of the image-containing region between the sheets for collecting and retaining excess processing liquid overrun.

3,816,129

SYNTHETIC SILVER HALIDE EMULSION BINDER

Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1973, Ser. No. 320,450

Int. Cl. G03c *1/72, 1/28, 1/02*

U.S. Cl. 96—114 **23 Claims**

A photosensitive silver halide emulsion wherein the emulsion binder comprises a graft copolymer of a quaternary ammonium alkyl acrylate salt on a polyhydroxy-substituted polymer.

3,816,130

PHOTOGRAPHIC PRODUCTION OF PHASE HOLOGRAMS AND DEVELOPING WITH A NONTANNING DEVELOPER

Joachim Eggers, and Hans-Theo Buschmann, both of Cologne, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 26, 1972, Ser. No. 247,812

Claims priority, application Germany, Apr. 28, 1971, 2120864

Int. Cl. G03c *5/04*

U.S. Cl. 96—27 H **5 Claims**

Photographic process for the production of phase holograms in silver halide emulsion layers. After exposure to light reflected from the hologram structure, the silver halide emulsion layer is developed with a nontanning developer, treated with a short stop bath, washed and then bleached in an oxidizing bleaching bath. The silver compound produced in the exposed areas of the layer by the bleaching process is dissolved out and the layer is then dried. Suitable non-tanning developers are, in particular, hydroquinone, 1-phenyl-pyrazolidone-3 or a compound or the p-aminophenol series.

3,816,131

PHOTOGRAPHIC DRY COPYING PROCESS

Helmut Kampfer, Koeln; Johannes Gotze, Berg. Neukirchen; Anita Von Koenig, Leverkusen, and Hans Ohlschlager, Koeln, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 23, 1971, Ser. No. 174,270

Claims priority, application Germany, Aug. 25, 1970, 2042054The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.

Int. Cl. G03c *5/5, 1/72*

U.S. Cl. 96—29 D **26 Claims**

Certain halogenated methine dyes make improved sensitizers for light-sensitive photographic layers containing the sensitizer and an image-producing compound capable of transfer at 80°–200°C. to an image-receiving layer in contact with the photographic layer, but rendered non-transferrable where exposed to light.

3,816,132

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIALS

Yukio Takegawa; Takao Matui, and Tetuya Higuchi, all of Tokyo, Japan, assignors to Oriental Photo Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,867

Claims priority, application Japan, Mar. 27, 1972, 47-30568

Int. Cl. G03c *1/60, 1/72*

U.S. Cl. 96—48 HD **16 Claims**

A heat-developable light-sensitive material containing no silver halide is provided. An image-forming ability is imparted to the material by activating the heat-developable light-sensitive reproducing material containing at least a silver salt of long chain fatty acid, an organic reducing agent and an organic carboxylic acid by means of a heat pre-treatment.

3,816,133

PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES BY MODIFYING VESICULAR IMAGES

Edith Weyde, Kurten; Maria Scheibitz, and Rudolf Meyer, both of Leverkusen, all of Germany, assignors to Afga-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 2, 1972, Ser. No. 222,971

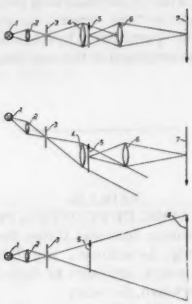
Claims priority, application Germany, Feb. 5, 1971, 2105488

Int. Cl. G03c *5/26*

U.S. Cl. 96—50 R **5 Claims**

Photographic images are produced by forming in a light-sensitive photographic layer a vesicular image which sub-

sequently is transformed by treatment with a swelling agent for the binder into a stable image consisting of differences in



the refractive index; the latter image can be made visible by suitable optical means.

3,816,134

PHOTOGRAPHIC COLOR DEVELOPING SOLUTIONS CONTAINING P-TOLUENESULFONIC ACID SALTS OF P-PHENYLENEDIAMINES

Dietmar Schellenberg, and Richard L. Bent, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,725

Int. Cl. G03c *7/00*

U.S. Cl. 96—55 **9 Claims**

The p-toluenesulfonic acid salts of certain p-phenylenediamine color developing agents have been found to possess extraordinarily and unexpectedly high solubility in aqueous alkaline solution. Thus, extremely concentrated solutions of these materials can be prepared to provide developer "concentrates" which are extremely economical to ship and working developer solutions which possess abnormally high developing agent concentrations and which are therefore capable of producing unusually high dye density levels in very short periods of time. Specifically preferred among these p-phenylenediamine salts are the di-p-toluenesulfonic acid salts of 3-alkyl and 3-alkoxy N-alkyl-N-alkoxyalkyl-p-phenylenediamine developing agents.

3,816,135

DIRECT POSITIVE SILVER HALIDE EMULSIONS THROUGH SYNERGISTIC EFFECTS OF FOGGING AGENTS AND ORGANIC REDUCING AGENTS AND/OR THEIR OXIDIZED FORMS

Heman Dowd Hunt, Webster, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1972, Ser. No. 239,734

Int. Cl. G03c *5/24, 1/28*

U.S. Cl. 96—64 **11 Claims**

High-speed direct positive silver halide emulsions characterized by improved densities and highlights are prepared containing a combination of a strong inorganic chemical fogging agent and an organic reducing agent and/or its oxidized form taken from the group consisting of methyl-p-aminophenol (metol), hydroquinone, quinone, quinhydrone, 1,4-naphthalenediol and 1,5-naphthalenediol, and an alkali metal sulfite, said combination being in an inert environment where it is unable to cause the formation of chemical fog centers or sensitivity centers on the silver halide grain surfaces before exposure and processing. Such an environment can be established by adjusting the pH range between 4.9 and 6.5.

3,816,136

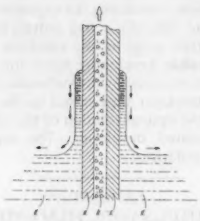
PHOTOGRAPHIC ELEMENT AND PROCESS OF DEVELOPING

Charles A. Goffe, Brockport; Richard W. Henn, Rochester, and Paul F. Swift, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 17, 1972, Ser. No. 272,535

Int. Cl. G03c *5/30, 5/26, 1/06*

U.S. Cl. 96—66 R **26 Claims**



A radiation-sensitive element containing incorporated processing chemicals is processed in a fluid activator which does not cause the processed element to be tacky. The element includes a fluid-impermeable support having thereon a radiation-sensitive material which is activated by the fluid developing agent and results in a processed element which is dry to the touch and is substantially free from tackiness when removed from contact with the fluid activator. If a stabilizer precursor is incorporated in the element, the image is stable to further exposure to raditaion.

3,816,137

AMINO HYDROXY CYCLOALKENONE SILVER HALIDE DEVELOPING AGENTS

Rolf S. Gabrielsen, Rochester, and Ismael A. Olivares, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 94,567, Dec. 2, 1970, Pat. No. 3,690,872. This application June 9, 1972, Ser. No. 261,492

Int. Cl. G03c *1/48*

U.S. Cl. 96—76 **4 Claims**

Photographic silver halide developing agents which are amino hydroxy cycloalkenone compounds having a five or six member cycloalkene nucleus provide increased development activity, e.g. reduced development time, and provide low-colored oxidation products without undesired sensitometric properties in developing a latent image in a photographic element. These developing agents can be employed in photographic elements and/or processing compositions. They can be employed in combination with other silver halide developing agents and addenda employed in photographic elements and/or processing compositions. They are suitable, for instance, in elements for dry processing with heat, and/or processing solutions and/or photographic emulsions.

3,816,138

SPECTRALLY SENSITIZED DIRECT POSITIVE SILVER HALIDE EMULSION LAYERS

Hans Ohlschlager, Bergisch-Gladbach Schildgen; Oskar Riester, and Alfons Dorlars, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 28, 1972, Ser. No. 267,165

Claims priority, application Germany, July 2, 1971, 2132937

Int. Cl. G03c *1/36, 1/16*

U.S. Cl. 96—101 **2 Claims**

Photographic direct positive silver halide emulsions are spectrally sensitized having a thiazole ring which is connected in 5-position through a methine chain to a 5- or 6-membered heterocyclic ring.

3,816,139

THERMOGRAPHIC COPY SHEET CONTAINING PHTHALIMIDE

Albert W. Leclair, Hudson, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Apr. 13, 1970, Ser. No. 28,068
Int. Cl. G03c 1/02, 1/76
U.S. Cl. 96—114.1 2 Claims

A thermographic copy sheet is formed with phthalimide toner in combination with a metal salt such as a silver salt, and a material which forms a colored product when reacted with the metal salt.

3,816,140

LIGHT-SENSITIVE COMPOSITION CONTAINING KETONE-FORMALDEHYDE RESIN

Eiichi Hasegawa, and Nobuo Tsuji, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 29, 1972, Ser. No. 267,712
Claims priority, application Japan, July 2, 1971, 46-48682
Int. Cl. G03c 1/70; G03f 7/10, 7/08
U.S. Cl. 96—115 R 10 Claims

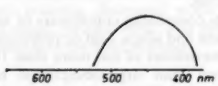
An inexpensive light-sensitive composition suited for use in print wiring or zinc relief printing, comprising a mixture of a light sensitive resin material such as polyvinyl cinnamate, polyvinyl cinnamylidene acetate or a rubber, e.g., cyclized, with an organic azide, with a ketone-formaldehyde resin such as those obtained by the condensation of formaldehyde with an aliphatic, aromatic or cycloaliphatic ketone in the presence of an alkali is disclosed.

3,816,141

FOGGED, DIRECT POSITIVE SILVER HALIDE EMULSION SENSITIZED WITH AN ISOINDOLINONE POLYMETHINE DYE

Oskar Riester, Leverkusen, and Hans Ohlschlager, Bergisch-Gladbach, Schildgen, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 12, 1972, Ser. No. 271,152
Claims priority, application Germany, July 14, 1971, 2135153
Int. Cl. G03c 1/08, 1/28
U.S. Cl. 96—137 1 Claim



Light-sensitive photographic direct positive material containing at least one fogged silver halide emulsion layer which layer contains a polymethine sensitizer containing an isoindolinone ring.

3,816,142

ELECTROLESS CHROMIUM PLATING PROCESS AND COMPOSITION

Karl H. Lindemann, Birkenstrasse 13, 6081 Geinsheim, Germany

Filed May 8, 1972, Ser. No. 251,409
Int. Cl. C23c 3/00
U.S. Cl. 106—1 10 Claims

Articles being electroplated with zinc are rapidly coated with a resistant and well adhering electroless chromium plating by immersing the articles in an aqueous bath containing

a. 8 to 15 liters of a solution of 250 to 350 g./l. of sodium dichromate and 200 to 300 g./l. of sodium nitrate, said solution being adjusted to pH .3 with nitric acid,
b. 3 to 8 liters of a solution of 500 to 700 g./l. of 85 percent formic acid and
c. .5 to 3 liters of glacial acetic acid and concentrated acetic acid respectively each per 100 liters and maintaining the pH value of the solution at a pH of 2.1 to 2.7.

3,816,143

NOVEL PHOSPHORUS-CONTAINING COMPOUNDS AND FLAME RETARDED POLYMERIC COMPOSITIONS THEREWITH

James J. Anderson; Wendell M. Byrd, Jr., and Vasco G. Camacho, all of Richmond, Va., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 859,196, Sept. 19, 1969, Pat. No. 3,706,821, which is a continuation-in-part of Ser. No. 826,019, May 19, 1969, abandoned. This application Mar. 2, 1972, Ser. No. 231,368
Int. Cl. C08f 45/58; C09d 5/18; C09k 3/28
U.S. Cl. 106—15 FP 21 Claims

The flammability of polymeric materials is substantially reduced or obviated by associating therewith novel halogen-containing phosphites, phosphates and phosphonates. Polymeric materials can be processed at elevated temperatures of the order of 250°-300°C. with certain of the phosphorus compounds.

3,816,144

MARKING INK AND METHOD OF USING THE SAME

Hans Vetter, Cologne, and Gunter Meinhardt, Leverkusen, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 7, 1971, Ser. No. 160,515
Claims priority, application Germany, July 11, 1970, 2034481
Int. Cl. C09d 11/00
U.S. Cl. 106—22 5 Claims

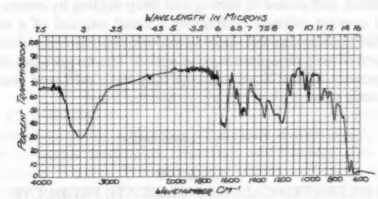
This invention relates to a new ink and a method for applying the ink to a surface, in particular to gelatin layers of photographic materials. The ink is comprised of a hydrophilic dye and a watersoluble, non-drying low molecular weight solvent which is liquid at room temperature.

3,816,145

TRIHYDROXYDIPHENYL AS AN ADDITIVE FOR FOUNDRY GREEN MOLDING SANDS

Ronald E. Melcher, Madison, N.J., assignor to Whitehead Brothers Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 28,964, April 15, 1970, abandoned. This application Aug. 31, 1972, Ser. No. 285,277
Int. Cl. B28b 7/34
U.S. Cl. 106—38.35 15 Claims



Tridyhroxydiphenyl is useful as an additive for improving the properties of foundry green molding sands or clays. The trihydroxydiphenyl is incorporated into the sand in the form of an aqueous solution. Alternatively, the solution may be applied to the surface of a green sand mold for use as a facing agent.

3,816,146
REFRACTORY RAMMING MIX
Nicholas Cassens, Jr., Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Oct. 20, 1972, Ser. No. 299,285
Int. Cl. C04b 35/04
U.S. Cl. 106—58 12 Claims

A ready-to-use refractory ramming mix which contains fine periclase and which can be rapidly heated immediately after being formed is made from refractory aggregate and, as bond, a mixture of oil and wax. The composition may also contain high temperature bonding and sintering agents such as volatilized silica and chromic oxide.

3,816,147
LIGHT-WEIGHT HIGH-STRENGTH CEMENT COMPOSITIONS USING HYDROLYZED ORGANIC MATERIAL
Anatole N. Vassilevsky, deceased, late of West Haven, Conn. (by Irene Vassilevsky, executrix), assignor to V. R. B. Associates, Inc., Lincolndale, N.Y.
Continuation-in-part of Ser. No. 829,158, May 26, 1969, Pat. No. 3,667,978, Continuation-in-part of Ser. No. 570,743, Aug. 8, 1966, Pat. No. 3,447,938, Continuation-in-part of Ser. No. 306,702, Sept. 5, 1963, abandoned. This application June 21, 1971, Ser. No. 155,262The portion of the term of this patent subsequent to June 11, 1989, has been disclaimed.
Int. Cl. C04b 9/02, 9/14
U.S. Cl. 106—105 4 Claims

A hydraulic cement binder consisting of magnesium oxide, magnesium sulfate and calcium chloride in proportion such that a magnesium oxychloride/magnesium oxysulfate/calcium sulfate hardenable mass is produced upon addition of water and setting. The binder is combined with cellulosic waste (municipality trash) which is treated with HCl or H_2SO_4 to partially hydrolyze the cellulosic material and thereafter with magnesium oxide or carbonate to neutralize it. For decreased brittleness and increased waterproofing characteristics, the binder contains sodium silicate and silicofluoride.

3,816,148
COMPOSITION AND PROCESS FOR STRENGTHENING AND SEALING GEOLOGICAL FORMATIONS AND STRATA IN MINING AND DEEP DRILLING
Horst Barthel, Hamburg, Germany, assignor to Oil Base Germany GmbH & Co. KG, Hamburg, Germany
Filed July 12, 1972, Ser. No. 271,008
Claims priority, application Germany, July 12, 1971, 2134722; Aug. 13, 1971, 2140618
Int. Cl. C04b 9/02
U.S. Cl. 106—107 8 Claims

Geological formations and strata are strengthened, solidified, and sealed in mining and deep drilling by means of a Sorel cement mixture containing a small amount of a water soluble ammonium salt such as ammonium chloride. A small amount of an aminoplast may be added. The magnesium oxide component of the Sorel cement may have admixed thereto magnesia usta.

3,816,149
HYDRATED CALCIUM SILLICATE PRODUCTS
Joseph H. Zettel, Martinsville, N.J., assignor to Johns-Manville Corporation, Greenwood Village, Colo.
Filed June 2, 1972, Ser. No. 259,164
Int. Cl. C04b 1/00
U.S. Cl. 106—120 14 Claims

A process is described for the formation of shaped hydrated calcium silicate products. The process comprises reacting a concentrated aqueous slurry of calcium oxide and silica sources in the presence of high pressure saturated steam, then simultaneously cooling and diluting the resultant crystal-containing slurry by gradual addition of water. Reinforcing fibers may then be added after which the desired shapes are molded and dried.

3,816,150
PROCESS FOR MODIFYING CELLULOSE ACETATE
Kiyoshi Ishii; Katumi Kojima, and Kazuo Ishikawa, all of Iruma, Japan, assignors to Daicel Ltd., Osaka, Japan
Filed Dec. 29, 1971, Ser. No. 213,824
Claims priority, application Japan, Dec. 30, 1970, 45-122233
Int. Cl. C08b 27/44, 27/26, 27/72, 27/30
U.S. Cl. 106—194 5 Claims

A process for modifying cellulose acetate by treating an object made of a mixed ester of cellulose and (1) acetic acid and (2) a polybasic carboxylic acid, i.e., a dibasic carboxylic acid and/or tribasic carboxylic acid, with a divalent or higher metal salt to impart solvent resistance to the object.

3,816,151
SELF-DESTRUCTING GELS
Thomas J. Podlas, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Aug. 3, 1972, Ser. No. 277,729
Int. Cl. C08b 27/72; C08f 45/46; C08b 21/30, 27/52
U.S. Cl. 106—194 5 Claims

Self-destructing polymer gels are prepared by adding to an aqueous solution of an anionic polymer a trivalent chromium compound and an oxidizer selected from either the water-soluble permanganates or persulfates. The polymer can be either an acrylamide—acrylic acid copolymer or CMC. Gelling takes place rapidly followed by decomposition of the gels over a period of several hours to several days.

3,816,152
COUPLING AGENT COPOLYMER DISPERSIONS OF SILICIC ACIDS AND ORGANOFUNCTIONAL SILANES
Paul Clifford Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 11,774, June 16, 1970, abandoned. This application Nov. 24, 1971, Ser. No. 202,005
Int. Cl. C09k 3/00
U.S. Cl. 106—287 SE 17 Claims

Coupling agents comprising copolymers of an organofunctional hydroxysilane and silicic acid or polysilicic acid having a degree of polymerization of not more than 1000 are more economical to use than organofunctional hydroxysilanes alone, and reinforcing fillers treated with these coupling agents exhibit less static electricity build-up and are more easily wet by organic resins. Solutions of an organofunctional silane and a tetraalkyl orthosilicate in each other or in nonaqueous solvents are stable coupling agents precursors which can be stored for several months with no loss in coupling effectiveness.

3,816,153
OPACITY OF CLAY FILMS
William E. Zentz, Jr., Iselin, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.
Filed July 10, 1972, Ser. No. 270,498
Int. Cl. C08h 17/06; C04b 33/04
U.S. Cl. 106—288 B 5 Claims

A small amount of a bismuth compound is incorporated with kaolin clay during the processing of the clay. The clay product is employed in an aqueous coating composition adapted for coating book or magazine paper in order to increase the opacity of the resulting clay film.

3,816,154

SILICA GEL FLATTING AGENT

Henry Baldyga, 8 S. Rolling, Cantonville, Md. 21228, and Thomas Elias McGoury, 14 Riggs Rd., Severna Park, Md. 21146

Filed May 18, 1973, Ser. No. 361,538
Int. Cl. C08h 17/00
U.S. Cl. 106—308 O 12 Claims

A very effective flatting agent for varnishes and lacquers is a silica gel which has been melt-coated with a miscible mixture of a wax and an organic fatty acid. The wax and the fatty acid should have a melting point above about 40°C, with the melting point of the wax and the fatty acid being less than the decomposition point of either of these components. The silica gel has an average particle size between about 2 microns and 10 microns, and preferably has a very narrow particle size distribution. When admixed into a lacquer or varnish, these silica gels create a light diffusing surface which gives the visual effect of a dull finish.

3,816,155

DECORATIVE WOOD GRAINING METHOD AND ARTICLES

Elizabeth M. Iverson, and Kenneth G. Iverson, both of 510 Sunset House North, Marco Island, Fla. 33937

Continuation-in-part of Ser. No. 854,761, Sept. 2, 1969, abandoned. This application Mar. 3, 1972, Ser. No. 231,723
Int. Cl. B44d 5/02, 5/06
U.S. Cl. 117—10 15 Claims

A method for producing decorative and ornamental protective coatings in simulation of wood graining. A plurality of portions of thixotropic viscous settable liquid coating vehicle colored with metallic pigments are prepared in either different colors, or shades of the same color, or both, depending upon the natural coloring of the wood to be simulated. These separate portions of vehicle are combined with a minimum of admixing, either in a common container from which the mixture is applied to a base surface, or by spreading the several vehicle portions onto the base. The applied coating mixture is allowed to level or is leveled into a relatively uniform layer. While still liquid and viscous, the leveled coating in most cases is furrowed to develop a lined pattern therein in simulation of wood graining. The coating is permitted to set up and harden. The coating may be formed on a nonadhering surface from which it may be stripped as a self-sustaining film. Effects such as sandblasted graining, distressed wood graining, burled graining, aged wood, pickled wood, and the like, may be obtained by variations of the basic method.

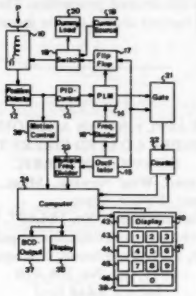
3,816,156

WEIGHING APPARATUS INCLUDING PULSE COUNTER MEANS HAVING A RELATIVELY SMALL CAPACITY

Arthur Baumann, Gfennstrasse 14, CH-8603 Schwerzenbach, and Werner Langenegger, Mattenhof 135, CH-8051 Zurich, both of Switzerland

Filed July 19, 1973, Ser. No. 380,720
Claims priority, application Switzerland, July 28, 1972, 11333/72
Int. Cl. G01g 19/40, 3/14, 7/00
U.S. Cl. 177—15 14 Claims

Weighing apparatus of the type including means for generating load compensation pulses the lengths of which correspond with the extent to which a load carrier member is displaced from its initial no-load position upon the application thereto of a load to be measured. High frequency counting pulses are counted by counter means during periods in which the compensation current pulses are applied to the load compensation coil of the apparatus, whereby the number of counting pulses is a function of the magnitude of the load being measured. The apparatus is characterized by the use of counter means having a relatively small capacity with respect to the measuring range of the apparatus, in combination with



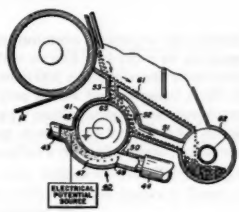
computer means which control the operation of the counter means to provide the appropriate digital measurement result.

3,816,157

TONER RECLAIMING METHOD

James M. Donohue, Rochester, and Dennis P. Gerbasi, West Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 847,866, Aug. 6, 1969, Pat. No. 3,654,901. This application Aug. 2, 1971, Ser. No. 168,378
Int. Cl. G03g 13/08, 13/22; B44d 1/094
U.S. Cl. 117—19 2 Claims



A toner reclaiming method includes the steps of directing removed toner particles into the vicinity of a surface and electrically charging the particles to a potential that will attract them to the surface, and then removing the toner particles from the surface and combining them with a flow of carrier beads so that a developing mixture is collected for reuse.

3,816,158

BONDING AND FORMING INORGANIC MATERIALS

Louis John Jacobs, 6153 N. Legett, Chicago, Ill. 60646

Filed July 11, 1972, Ser. No. 270,785
Int. Cl. B44d 1/094; B44c 1/06
U.S. Cl. 117—26 9 Claims

Components for apparatus of various shapes are formed from inorganic particulate materials and binders. The base material is selected from the metal oxides and those metals and metal carbides which contain a small amount of oxide on the surface, for example, alumina. These particles are treated with a binder solution which may be any solution of an inorganic compound that can be converted to an oxide on being heated, for example, chromium trioxide solution. The particles are then coated with a fine powdered material of the same composition as the base particles to form free-flowing pellets. The pellets are then heated to convert the binder material to the oxide form. The treatment with binders and the heating step are then repeated as often as desired. The pellets are then

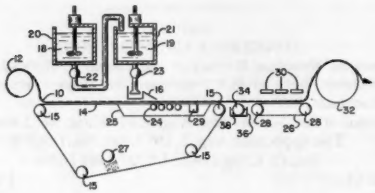
impregnated with additional binder and formed into the desired shape and again heated. The formed shape is then impregnated with additional binder and heated as often as desired to obtain the desired properties. The shapes can then be machined and various shapes can be joined together.

3,816,159

PROCESS FOR APPLYING AN AQUEOUS DISPERSION OF SHORT, BINDER COATED FIBERS TO A DRYLAID NONWOVEN FABRIC

Nicholas S. Newman, West Newton, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 144,607, May 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 831,564, June 9, 1969, abandoned. This application Dec. 9, 1971, Ser. No. 206,410
Int. Cl. B44d *1/02*
U.S. Cl. 117—28 13 Claims



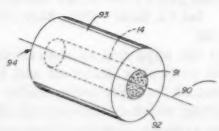
Nonwoven fabrics of improved abrasion resistance are produced by applying to a dry-laid fibrous web an aqueous dispersion of ultra-short fibers of 50 to 300 microns in length, said ultra-short fibers being coated with a polymeric binder and being suspended in an aqueous phase which is substantially free of binder. The dry-laid fibrous web may be bonded in a separate operation, optionally with a different polymeric binder and in a discontinuous pattern.

3,816,160

METHOD OF MAKING A PLASTIC OPTICAL ELEMENT

Robert S. Moore, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 134,995, April 19, 1971, Pat. No. 3,718,383. This application Nov. 30, 1972, Ser. No. 311,018
Int. Cl. B29d *11/03*; B44d *5/06*; C03c *11/28*
U.S. Cl. 117—33.3 8 Claims



The invention relates to a transparent element for the deflection of incident electromagnetic radiation having an optical axis extending therethrough. The element includes a shaped polymeric matrix having an organic diluent therewithin, the diluent forming a continuous gradient in refractive index extending in a direction substantially perpendicular to the optical axis of the element. The element has lens-like properties.

3,816,161

GLASS-CERAMIC DECORATION

Michael J. Buckley, Brackenridge, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 19, 1970, Ser. No. 82,165
Int. Cl. C03c *5/00*, *7/00*
U.S. Cl. 117—37 R 6 Claims

An improved method for decorating glass-ceramic articles whereby high fidelity decorations having uniform color and sharply defined edges are integrated into the glass-ceramic crystal structure by contacting the articles with decorating pastes containing colorants and titanium dioxide having a crystal content of greater than 90 percent by weight anatase, the remainder rutile, and heating the combination to the crystallization temperature of the glass-ceramic.

3,816,162

APPLYING OF PYROLYZABLE AND POLYMERIC MATERIAL TO SUBSTRATE

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois Inc., Toledo, Ohio

Filed Oct. 14, 1971, Ser. No. 189,449
Int. Cl. 264 *29*; B44d *1/44*
U.S. Cl. 117—46 CA 8 Claims

There is disclosed the in situ synthesizing of a polymeric material on a substrate by applying to the substrate a solid pyrolyzable binder which contains at least one member capable of polymerizing at or above the pyrolysis temperature of the binder and then applying heat so as to pyrolyze the binder and synthesize the polymer such that the pyrolyzed binder is not a part of the in situ synthesized polymeric material.

3,816,163

REFRACTORY ARTICLE AND METHOD FOR PRODUCING SAME

Bulent E. Yoldas, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 878,106, Nov. 19, 1969, Pat. No. 3,681,113. This application Dec. 15, 1971, Ser. No. 208,493The portion of the term of this patent subsequent to Aug. 1, 1989, has been disclaimed.
Int. Cl. C03c *25/00*
U.S. Cl. 117—46 FA 5 Claims

Impregnated refractory structures, such as, for example, bricks which have increased resistance to the destructive action of molten glass are disclosed. The structures are produced by an impregnation and densification process in which conventional, prefabricated, solid, porous, refractory structures are first treated with a solution of a polysilicon compound which is thermally decomposable to silica, and the solution-treated structure is then heat treated, to cause a deposition of amorphous silica in the brick pores. Because of the silica deposition and pore impregnation, a densification and decrease in porosity is effected which greatly decreased molten glass penetration and internal destruction of the silica impregnated refractory structure. The use of these impregnated structures also produce a glass with substantially fewer seeds. A particularly suitable polysilicon compound which may be employed is a hydrolyzed and condensed ethyl silicate.

3,816,164

SUBSTRATE COATED WITH A ROOM TEMPERATURE CURABLE ORGANOPOLYSILOXANE AND METHOD FOR COATING

Anthony Enrico Pepe, Wilton; Guenther Fritz Lengnick, Manitou Beach, and Charles George Neuroth, Blissfield, all of Mich., assignors to Stauffer Chemical Company, Adrian, Mich.

Division of Ser. No. 27,454, April 10, 1970, Pat. No. 3,684,793, which is a continuation-in-part of Ser. No. 688,336, Dec. 6, 1967, abandoned. This application Apr. 5, 1972, Ser. No. 241,415

Int. Cl. C07d *103/02*; **B44d** *1/14*

U.S. Cl. 117—72 **5 Claims**

The invention relates to curable organopolysiloxane compositions in comprising an organopolysiloxane and a disilaorganic cross-linking agents containing functional groups which are hydrolyzable in the presence of ambient moisture. The compositions are applied to substrates and thereafter a room-temperature curable organopolysiloxane is applied to the coated substrate.

3,816,165

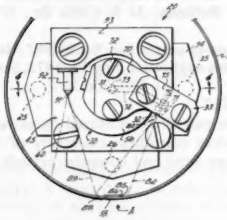
IMPROVED METHOD AND APPARATUS FOR STRIPPING INSIDE SEAMS OF CANS

Richard A. Horvath, Amherst; William C. Stumphauzer; Edwin F. Hogstrom, both of Sheffield Lake, and Alvin A. Rood, Westlake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 21, 1972, Ser. No. 246,185

Int. Cl. B05c *7/02*, *9/14*; **B05b** *13/06*, *7/16*

U.S. Cl. 117—96 **6 Claims**



A method and apparatus for applying an impervious protective coating over the seams of cylindrical metal can bodies either before or after the seams are welded, soldered, or cemented. The apparatus is operable to intermittently apply an airless spray to the interior overlapped seams of the cans as they continuously move past an airless spray gun secured to the end of a stubhorn of a can forming line. This apparatus includes an airless spray nozzle located on one side of the seams for directing a spray onto the inside corner of the seams of the formed can bodies and an air jet located on the opposite sides of the seams from the spray nozzle for confining the atomized spray or fog to the seam area of the can.

3,816,166

VAPOR DEPOSITING METHOD

Franciscus Cornelis Eversteijn, and Hermanus Leonardus Peek, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

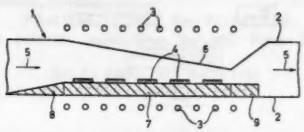
Division of Ser. No. 120,983, March 4, 1971, Pat. No. 3,750,620. This application May 16, 1973, Ser. No. 360,670

Claims priority, application Netherlands, Mar. 11, 1970, 7003431

Int. Cl. C23c *1/06*

U.S. Cl. 117—106 A **3 Claims**

In a method of semiconductor manufacture wherein a semiconductor substrate is supported on a susceptor and subjected to a vapor stream wherein are maintained predeter-



mined conditions of stream rate, pressure and temperature and of decreasing reactor height.

3,816,167

STAIN-RELEASING TEXTILES OF SYNTHETIC FIBERS AND PROCESS FOR TREATING TEXTILES OF SYNTHETIC FIBERS

William J. Schultz, Vadnais Heights, and Patsy O. Sherman, Bloomington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 20, 1971, Ser. No. 190,921

Int. Cl. D06m *13/12*

U.S. Cl. 117—138.8 F **8 Claims**

Stain releasing from synthetic fibers is assured during laundering by applying a treatment of fluoroaliphatic comonomer and polyalkylene glycol cross-linked in situ by an aldehyde-containing prepolymer.

3,816,168

NITROCELLULOSE-MODIFIED URETHANE COATING COMPOSITIONS AND THEIR USE IN FINISHING LEATHER

Sheldon N. Lewis, Willow Grove, and Matthew R. Yunaska, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 161,987, July 12, 1971, Pat. No. 3,763,061. This application Apr. 2, 1973, Ser. No. 347,303

Int. Cl. B44d *1/32*

U.S. Cl. 117—142 **3 Claims**

Compositions comprising nitrocellulose and an isocyanate-terminated prepolymer of a polyisocyanate with an aliphatic polyol are useful as coating compositions, particularly in treating leather and leather substitutes.

3,816,169

FIBROUS AND NON-FIBROUS SUBSTRATES COATED WITH MICROCAPSULAR OPACIFIER SYSTEM AND THE PRODUCTION OF SUCH COATED SUBSTRATES

Anthony E. Vassiliades, Deerfield; Edward F. Nauman, Lake Forest, and Shrenik Shroff, Chicago, all of Ill., assignors to Champion International Corporation, New York, N.Y.

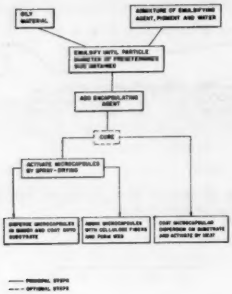
Division of Ser. No. 820,267, April 29, 1967, Pat. No. 3,669,899, which is a continuation-in-part of Ser. No. 786,337, Dec. 23, 1968, Pat. No. 3,585,149. This application Apr. 20, 1972, Ser. No. 246,082

Int. Cl. D21h *1/28*; **B32b** *29/04*

U.S. Cl. 117—155 R **29 Claims**

Fibrous and non-fibrous substrates are rendered highly opaque by providing the substrate with a coating of discrete,

substantially spherical, air-containing microcapsules having substantially continuous organic, polymeric, solid walls, an average particle diameter of below about 2 microns and having pigment particles incorporated in the microcapsular structure.



3,816,170

VAPOR PERMEABLE COMPOSITIONS

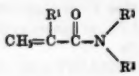
John P. Mudde, Oak Lawn, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. Nos. 226,202, Feb. 14, 1972, abandoned, and Ser. No. , , which is a continuation-in-part of Ser. No. 122,148, March 8, 1971, abandoned. This application Apr. 14, 1972, Ser. No. 244,251

Int. Cl. B44d *1/12*

U.S. Cl. 117—161 UN **10 Claims**

This invention discloses a water vapor permeable filmforming composition comprising: (a) a hydrophilic thermoplastic polymeric material comprising from about 10 to about 60 parts by weight of a homopolymer, copolymer or graft copolymer of an unsaturated amide of the formula:



wherein R^1 is selected from the group consisting of hydrogen and alkyl of up to four carbon atoms, R^2 and R^3 are alkyl of up to four carbon atoms; and (b) a hydrophobic polymeric material comprising from about 90 to about 40 parts by weight of a polymer selected from the group consisting of a polymer of vinyl chloride, polyurethane, poly(methyl methacrylate), polyamide, polypropylene and polyester.

3,816,171

THERMOPLASTIC SEALED-SHEATH COVERING UPON ELECTRICAL BUS-BAR CONDUCTORS

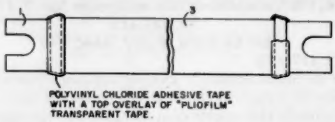
Julius Toth, Beaver, and Edward M. Walker, Industry, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 888,296, Dec. 29, 1969, abandoned. This application Sept. 10, 1971, Ser. No. 179,353

Int. Cl. B44d *1/18, 1/52*

U.S. Cl. 117—212 **12 Claims**

An improved and relatively inexpensive electrical conductor, such as a bus-bar, or feeder conductor, of aluminum or copper, for example, is provided with a thermoplastic elongated tubular sheath, or sheath tubing, such as polyvinyl chloride heat-reactive tubing of resinous material, having the ends of the sheath, or tubing, sealed, in a water-tight fashion to the bus-bar by a thermoplastic resinous tape material. In one method of the invention, the resinous tape may be wound adjacent the outer ends of the bus-bar at spaced areas thereon, and the thermoplastic tubing subsequently pulled, as a second operation, upon the bus-bar and heat shrunk into place over the aforesaid spaced taped areas.



Another alternate method for sealing the thermoplastic sheath tubing to the bus-bar, is to heat-shrink the thermoplastic insulating tubing, or "boot" upon the bus-bar after pulling it into place, scalp excess tubing to a specified dimension upon the bus-bar, and then band or tape each of the scalped ends of the tubing, or "boot" with a suitable thermoplastic resinous tape material, such, for example, as polyvinyl chloride adhesive tape.

3,816,172

NONREDUCIBLE PARTIALLY CRYSTALLIZED CROSSOVER DIELECTRICS

Lewis Charles Hoffman, 34 S. Cliffe Dr., Wilmington, Del. 19809

Continuation-in-part of Ser. No. 86,985, Nov. 4, 1970, abandoned. This application July 12, 1972, Ser. No. 270,958

Int. Cl. C23d *5/10*

U.S. Cl. 117—212 **6 Claims**

Nonreducible partially crystallized crossover dielectrics in electronic devices consisting essentially of certain glasses which have been fired and comprise crystals dispersed in a glassy matrix.

3,816,173

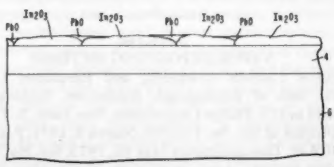
FABRICATION OF VARIABLE CURRENT DENSITY JOSEPHSON JUNCTIONS

Jerome Michael Eldridge, and Juri Matisoo, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,307

Int. Cl. H01l *3/00*

U.S. Cl. 117—217 **7 Claims**



Alloying the base electrode of a lead-oxide-lead Josephson tunnel junction with indium will effectively result in an oxide

having a low barrier height. Consequently, much thicker barriers can be produced without severely limiting the magnitude of the tunnel current. Furthermore, by varying the indium concentration in an array of Pb-In electrodes on a single chip, one can produce various different functioning devices while employing only a single oxidation process.

3,816,174

PROCESS FOR PREPARING A LACTULOSE SYRUP

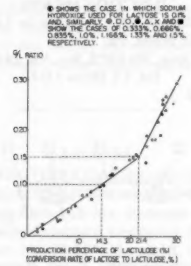
Taro Nagasawa; Mamoru Tomita; Yoshitaka Tamura, all of Tokyo; Tomokazu Obayashi, Tanashi, and Teruhiko Mizota, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed May 17, 1972, Ser. No. 254,169

Claims priority, application Japan, May 22, 1971, 46-34454

Int. Cl. C07c *49/18*

U.S. Cl. 127—42 **4 Claims**


● SHOWS THE CASE IN WHICH SODIUM HYDROXIDE USED FOR LACTOSE IS 0.5% AND, SIMILARLY, ●, ○, ◐, ◑, ✕ AND ■ SHOW THE CASES OF 0.333%, 0.666%, 0.835%, 1.0%, 1.166%, 1.33% AND 1.5%, RESPECTIVELY.
% RATIO
0.30
0.25
0.15
0.10
0
0
14.3
20 21.4
30
PRODUCTION PERCENTAGE OF LACTULOSE (%)
(CONVERSION RATE OF LACTOSE TO LACTULOSE, %)

A lactulose syrup containing more than 80 percent lactulose in total solid content, is produced in an industrially acceptable manner by admixing an aqueous solution of lactose with an aqueous solution of sodium hydroxide containing less than 0.54 percent sodium hydroxide based on the quantity of lactose, heating said mixed solution to a temperature of above 70°C. to isomerize the lactose, and thereafter concentrating lactulose from the reaction liquid.

3,816,175

PROCESS FOR FORMATION OF CRYSTALLINE FRUCTOSE-GLUCOSE BLENDS

Asko J. Melaja, Kantvik, Finland, assignor to Suomen Sokeri Osakeyhtio (Finnish Sugar Company), Helsinki, Finland

Filed July 3, 1972, Ser. No. 268,501

Int. Cl. C13k *1/10, 9/00*

U.S. Cl. 127—60 **7 Claims**

A dry, granulated, free-flowing product containing a mixture of fructose and glucose, e.g. invert sugar, is prepared by first combining a fructose and glucose solution having a high dry solids content with an essentially dry, crystalline mass comprising a mixture of fructose and glucose. The admixture of solution and crystalline mass are then agitated in a relatively dry atmosphere, i.e., less than about 30 percent relative humidity, at a temperature from about 20°C to about 50°C to form the dry, granulated, free-flowing product.

3,816,176

METHOD AND APPARATUS FOR CLEANING STRAINERS

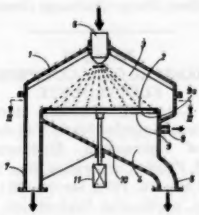
Lars-Goran Rundqvist, Tumba, Sweden, assignor to AB Celleco, Tumba, Sweden

Filed Mar. 21, 1973, Ser. No. 343,233

Claims priority, application Sweden, Mar. 29, 1972, 4067/72

Int. Cl. B08b *3/02*; B07b *1/50*

U.S. Cl. 134—34 **3 Claims**



The cleaning is effected by spraying water or other fluid upon one side of the strainer while positioning a reflecting surface closely adjacent the other side, whereby the spray passing through the strainer strikes this surface.

3,816,177

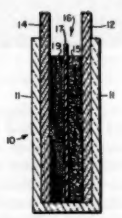
SECONDARY CELLS AND BATTERIES

Myles A. Walsh, West Falmouth, Mass., assignor to Eco-Control, Inc., Cambridge, Mass.

Filed Nov. 17, 1972, Ser. No. 307,650

Int. Cl. H01m *43/00*

U.S. Cl. 136—24 **24 Claims**



Secondary cells include a zinc or cadmium electrode, a counter electrode formed of an inert material for holding electrochemically active halogens such as bromine, chlorine and iodine, an aqueous zinc halide or cadmium halide electrolyte, a quarternary ammonium halide and a depolarizer in the electrolyte. The depolarizer is an organic complexing solvent which dissolves in water, is non-reactive towards the halogen or halogens in the cell and forms a water insoluble complex in the presence of quarternary ammonium polyhalides. The quarternary ammonium halides are chosed so that at the counter electrode they combine with halogens to form polyhalides.

A series-type battery has a plurality of these cells.

3,816,178
ALKALINE STORAGE BATTERY HAVING ZINC ELECTRODE

Yoshiyuki Maki, Fujisawa; Masaru Fujita, Higashitoyoda; Hideo Takahashi, Yokohama, and Tetsuo Ino, Maebashi, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., both of Tokyo, Japan

Filed Apr. 13, 1971, Ser. No. 133,596
Claims priority, application Japan, Apr. 17, 1970, 45-32324
Int. Cl. H01m 43/02
U.S. Cl. 136—30 10 Claims

A zinc electrode containing both of calcium and lead is a most suitable negative electrode for an alkaline storage battery and has excellent charge-discharge characteristics.

3,816,179
ELECTROCHEMICAL CELL COMPRISING A SOLID ELECTROLYTE

Frederik Karel Lotgering; Nicolaas Marinus Beekmans; Gerardus Henricus Antonius Maria Van der Steen; Leopold Heigne, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

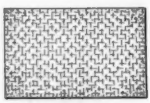
Filed Aug. 16, 1972, Ser. No. 281,109
Claims priority, application Netherlands, Aug. 19, 1971, 7111412
Int. Cl. H01m 11/00, 35/02
U.S. Cl. 136—83 R 2 Claims

An electrode for an electrochemical cell comprising a solid electrolyte, which electrode consists entirely or partly of solid solutions having the spinel structure defined by the formula CuM_yCr_2e ,in which M represents Cu or Ag and in which y = 0–1 when M = Cu and y = 0–0.4 when M = Ag.

3,816,180
METHOD FOR PREPARING TEXTURIZED CATHODES

Edward J. Curelop, 17 Granite Street, Brockton, Mass. 02402

Filed July 12, 1972, Ser. No. 270,915
Int. Cl. H01m 35/24
U.S. Cl. 136—120 R 9 Claims



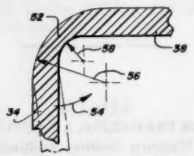
A method for preparing depolarizing cathodes of improved performance is disclosed. The method comprises texturizing the surface of the depolarizer cathode by interposing an element having at least one texturized surface between the depolarizer mix and a compression source and embossing the texture onto the cathode slab formed by the application of pressure from the pressure source. Improved capacity and improved low temperature performance resulted from the electrodes prepared by practice of this invention.

3,816,181
STORAGE BATTERY AND CASE THEREFOR

Paul J. Buckethal, Villa Hills, Ky., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Dec. 9, 1971, Ser. No. 206,451
Int. Cl. H01m 1/00
U.S. Cl. 136—166 18 Claims

An improved storage battery and case therefor are disclosed in which the storage battery case is fabricated of a polyolefin, and preferably, polypropylene. The bottom, side walls, end walls and partitions are of substantially uniform thickness and have a thickness generally less than .100 inch. The corners of the battery case have a reduced thickness significantly less than the thickness of the side and end walls adjacent to the corners such that certain forces and stresses within the case and the material from which it is made are relieved whereby the case remains more rectilinear.

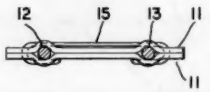


Furthermore, the reduction in the thickness of the corners provides improved strength characteristics in the overall product. A unique method of manufacturing such a battery and battery case is provided including prescribed mold characteristics and controls over molding temperatures and cooling rates.

3,816,182
TAPE THERMOCOUPLE WITH INSULATION PIERCING JUNCTION MEANS

Will McAdam, Bluebell, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Aug. 30, 1972, Ser. No. 285,010
Int. Cl. H01v 1/04
U.S. Cl. 136—230 2 Claims

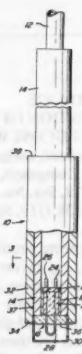


Twin lead thermocouple tape, thermocouples made therefrom, and methods for making the thermocouples including means to insure connection of the thermocouple to a circuit with the proper polarity.

3,816,183
HIGH TEMPERATURE MOLTEN METAL THERMOCOUPLE

Max H. Kraus, Elkins Park, Pa., assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Sept. 26, 1972, Ser. No. 292,352
Int. Cl. H01v 1/02
U.S. Cl. 136—234 13 Claims



A non-splash temperature measuring device for repeated immersion in molten metal is disclosed. The immersion end in-

cludes a vacuum cast sleeve of refractory fibers having low density and a low rate of thermal conductivity, while having high temperature stability and being capable of resisting thermal shock.

3,816,184

CORROSION INHIBITING PROCESS USING SILICON-CONTAINING AMINOMETHYL PHOSPHONATES

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, both of Mo., assignors to Petrolite Corporation, Wilmington, Del.

Division of Ser. No. 80,124, Oct. 12, 1970, Pat. No. 3,716,569. This application Oct. 2, 1972, Ser. No. 294,236

Int. Cl. C23f 11/16, 11/14

U.S. Cl. 148—6.15 **5 Claims**

Silicon-containing aminomethyl, or substituted aminomethyl, phosphonic acids and derivatives thereof. The silicon atom is silicone functional (i.e., has a —SiO— group) and is also attached to an alkyleneamino group which may have one or more amino groups (i.e., an alkyleneamin group having at least one N-H group) capable of reacting with a carbonyl compound (i.e., aldehyde or ketone) and phosphorous acid, or a derivative thereof, to form aminomethyl phosphonic acid. All, or less than all, of the N-H groups may be converted to aminomethyl phosphonic acids. The silicon-aminomethyl phosphonic acids may be monomeric, polymeric, or copolymeric. They are useful, for example, as corrosion inhibitors, scale inhibitors, water clarifiers and for other uses.

3,816,185

PROTECTIVE COATING ON WIRE

Emil Toledo, Natick; Luke Dzwonczyk, Marlboro, both of Mass., and Roger Shih-Yah Mo, Redondo Beach, Calif., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 20,851, March 18, 1970, abandoned. This application Jan. 7, 1972, Ser. No. 216,268

Int. Cl. C23f 7/00

U.S. Cl. 148—6.24 **6 Claims**

A chemical bath for applying a protective coating on magnetically plated wire during in-line processing, the bath comprising an aqueous alkaline solution including a 0.05 to 0.25 percent concentration of an adsorbable, organic corrosion inhibitor from the class consisting of thiazole, urea and amine compounds; and a 1 to 5 percent concentration of an inorganic, PH stabilizer from the class consisting of borate, benzoate and phosphate salts of sodium and potassium.

3,816,186

COMPOSITION AND METHOD FOR PRODUCING BROWN COATING ON BRASS

Richard W. Brough, Windsor, Conn., assignor to Conversion Chemical Corporation, Rockville, Conn.

Filed Nov. 9, 1972, Ser. No. 304,968

Int. Cl. C23f 7/24, 5/02

U.S. Cl. 148—6.24 **21 Claims**

An aqueous bath for imparting a brown surface coating to brass workpieces is provided by an aqueous solution of cupric carbonate; a thiosulfate or hydrosulfite color modifier; an organic color intensifier; and ammonium hydroxide in an amount sufficient to provide a pH of about 10.5 to 12.5. The workpieces are immersed in the bath, preferably at ambient temperature, for a period of time sufficient to develop a uniform brown finish thereon. The color intensifiers may be aliphatic and aromatic carboxylic acids, aliphatic and aromatic aldehydes, aliphatic and aromatic ketones, aliphatic and aromatic amines, aliphatic alcohols, oxidation-resistant hydroxybenzene compounds, aromatic phosphonic and sulfonic acids, and mixtures thereof.

3,816,187

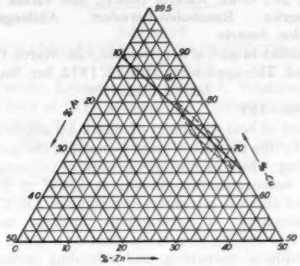
PROCESSING COPPER BASE ALLOYS

Richard Dale Smith, 51 Twin Cones Rd., Madison, Conn. 06443, and Irwin Broverman, 7337/B S. Shore Dr., Apt. 1017, Chicago, Ill. 60649

Division of Ser. No. 115,839, Feb. 16, 1971, abandoned, which is a continuation of Ser. No. 800,354, Feb. 10, 1969, abandoned, which is a continuation of Ser. No. 530,942, March 1, 1966, abandoned. This application July 24, 1972, Ser. No. 274,807

Int. Cl. C22f 1/08

U.S. Cl. 148—11.5 R **3 Claims**



A process for obtaining improved strength properties and improved stress corrosion resistance in copper base alloys including the steps of hot rolling, annealing, cold rolling, and stress relief annealing.

3,816,188

LOW-FUMING GALVANIZING FLUXES

Dong M. Chay, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 316,404, Dec. 18, 1972, abandoned. This application Apr. 13, 1973, Ser. No. 350,797

Int. Cl. C23c 1/12

U.S. Cl. 148—26 **14 Claims**

Low-fuming galvanizing fluxes are provided which exhibit superior fluxing activity and which contain zinc chloride or zinc bromide and a zinc phosphate or zinc phosphite as the active agents. Galvanizing fluxes of this invention may also contain a small amount of a foaming agent and the chloride or bromide of sodium, potassium, lithium, magnesium and/or calcium.

3,816,189

SOLID-STATE DIFFUSION PROCESS FOR THE MANUFACTURE OF PERMANENT MAGNET ALLOYS OF TRANSITION ELEMENTS AND METALS OF THE RARE-EARTH GROUP

Jean-Paul Haberer, Saint Martin d'Heres, and Roger Noel Fontaine, Montbonnot, both of France, assignors to Societe D'Etudes Et De Recherches Magnetiques (S.E.R.M.A.G.), Saint Martin D'Heres, France

Filed Dec. 10, 1971, Ser. No. 206,732

Claims priority, application France, Dec. 10, 1970, 70.44447

Int. Cl. H01f 1/02

U.S. Cl. 148—101 **3 Claims**

For the manufacture of permanent magnet alloys containing transition elements and rare-earth metals, the alloying operation usually gives rise to considerable difficulties.

An improved alloying process is provided, which includes induction melting of the alloy constituents in a refractory crucible, and wherein the transition elements are melted by successive stages, the resulting alloy being cooled at the com-

mencement of its solidification and the rare-earth metals being added through direct diffusion in the cooled alloy.

This process is of special interest in the manufacture of a cobalt-samarium alloy. The attack of the crucible by the samarium is avoided, and the loss of samarium through evaporation is reduced.

3,816,190

METHOD OF HEAT-TREATMENT OF ALUMINUM ALLOYS

Peter Warbichler, deceased, late of Graz, Austria (by Barbara Warbichler, heir); Barbara Warbichler, Jr., Graz, Austria; Ingrid Fraioli, nee Warbichler, Graz, Austria; Peter Warbichler, Jr., Graz, Austria (heirs), and Firma Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Ranshofen, Austria

Continuation-in-part of Ser. No. 806,926, March 13, 1969, abandoned. This application May 22, 1972, Ser. No. 255,511

Int. Cl. C22f 1/04

U.S. Cl. 148—159 **6 Claims**

A method of heat treatment of aluminum alloys of the type Al-Mg-Si for the purpose of improvement of the processibility by extruding, which comprises the steps of subjecting said alloys to a homogenization-glowing at 530°C to 580°C, and cooling and alloys to a temperature range of 230°C to 270°C, while maintaining a substantially uniform temperature gradient. The cooling step takes place at a speed of at least 100°C/h without quenching, and a holding period is maintained within the temperature range of 230°C to 270°C, for a time period of about 4 to 24 hours, whereupon further cooling or heating to working temperature of said alloys is performed.

3,816,191

METHOD OF MAKING CALCIUM NITRATE EXPLOSIVE COMPOSITION

John S. Wilson, Lake Jackson, Tex.; Willard F. Clark, and Thomas E. Slykhouse, both of Midland, Mich., assignors to The Dow Chemical Corporation, Midland, Mich.

Division of Ser. No. 34,522, May 4, 1970. This application May 30, 1972, Ser. No. 257,830

Int. Cl. C06b 1/04

U.S. Cl. 149—41 **6 Claims**

An explosive composition and method is provided containing a mixture comprising calcium nitrate, a water miscible organic fuel and water.

3,816,192

A PROCESS FOR PREPARING LITHIUM ALUMINUM HYDRIDE-ALUMINUM HYDRIDE COMPLEXES

Frank M. Brower, Midland; Arthur L. Daniels, Colman, both of Mich., and George S. Fujioka, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1960, Ser. No. 75,439

Int. Cl. C01b 1/00

U.S. Cl. 149—109 **3 Claims**

A complex of Li AlH_4 and AlH_3 is prepared by mixing substantially anhydrous ether solution of $AlCl_3$ and $LiAlH_4$ in a dry inert atmosphere. By-product LiCl is removed and the complex hydride is subsequently recovered.

3,816,193

METHOD OF PREPARING A BERYLLIUM HYDRIDE-CONTAINING COMPOSITE

Gottfried J. Brendel, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 31, 1969, Ser. No. 797,726

Int. Cl. C06b 19/00

U.S. Cl. 149—109 **12 Claims**

Crystalline beryllium hydride composites of increased density are prepared by heating, to an elevated temperature and under elevated pressure, the corresponding amorphous composites containing a relatively small amount of lithium as a hydride or alkyl derivative. The elevated temperature is maintained for a period of time and the pressure is alternately reduced and reestablished either during the heating process or during the period of maintenance at the elevated temperature to bring about the desired crystallization and densification.

3,816,194

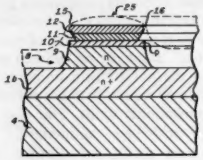
HIGH FREQUENCY DIODE AND METHOD OF MANUFACTURE

Harry Kroger, Sudbury, and Curtis N. Potter, Holliston, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 4, 1972, Ser. No. 223,616

Int. Cl. H01l 7/50

U.S. Cl. 156—3 **3 Claims**



High frequency diodes are manufactured by methods in which extended dual mesas are formed upon a conductive substrate, one mesa incorporating the active junction and the other supporting the active mesa in reduced parasitic capacitive relation, with the substrate supporting the combination of mesas and with an efficient heat sink cooperating with the active mesa. Novel ring-shaped diodes made according to the method feature a high degree of circular symmetry and therefore freedom from burn out, thermal compression bonding being used to perfect the bond between the active mesa and a diamond heat sink. Symmetry of the diode is assured by use of a novel photoresist mask generation technique.

3,816,195

METHOD OF MAKING CONDUCTOR PLATE WITH CROSSOVER

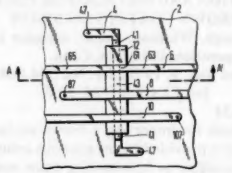
Ernst Hebenstreit, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 10, 1972, Ser. No. 279,502

Claims priority, application Germany, Sept. 2, 1972, 2144078

Int. Cl. C23f 1/02

U.S. Cl. 156—3 **16 Claims**



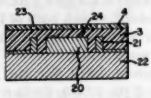
Printed circuit type of carrier plate and method of producing the plate by printed circuit technology. The carrier plate is made from an insulated plate having a copper layer extending over its top surface and has a conductor path extending transversely of the plate and at least one other conductor path at right angles to the first conductor path, and having a crossover insulated from the transverse conductor path to form a continuous conductor path extending across the transverse conductor path.

3,816,196

PASSIVATION OF PHOTORESIST MATERIALS USED IN SELECTIVE PLASMA ETCHING

Donald J. La Combe, De Witt, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed June 7, 1971, Ser. No. 150,503
Int. Cl. B44c 1/22
U.S. Cl. 156—8 4 Claims



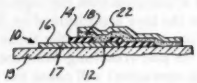
A method is disclosed for selective plasma etching of organic material by means of a low temperature plasma which reacts with the organic material through an apertured mask overlaying said material. The method has particular application to electronic circuit fabrication. A preferred organic dielectric material is a polymer of fluorinated ethylene propylene and a suitable mask for plasma etching of this material is a photoresist composition, which has been passivated to be resistant to attack by the plasma.

3,816,197

FILM DEPOSITED SEMICONDUCTOR DEVICES

Ronald G. Neale, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 867,341, Oct. 17, 1969, Pat. No. 3,675,090. This application June 21, 1972, Ser. No. 264,937
Int. Cl. H01l 7/50
U.S. Cl. 156—8 10 Claims



A method comprising providing a substrate with an electrode-forming layer on the surface thereof, placing the substrate in a contaminant-free space and while in said space removing the exposed surface portions of said electrode-forming layer and depositing generally over the substrate and said electrode-forming layer an active semiconductor material forming a semiconductor switch device, applying a mask over selected areas of said active semiconductor material to cover only the area thereof to be occupied thereby in a completed device, and selectively removing the active semiconductor layers not covered by said mask.

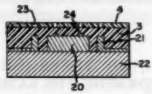
3,816,198

SELECTIVE PLASMA ETCHING OF ORGANIC MATERIALS EMPLOYING PHOTOLITHOGRAPHIC TECHNIQUES

Donald J. La Combe, 145 Robbins Ln., DeWitt, N.Y. 11324, and Guy L. Babcock, 33 Homeland Rd., North Syracuse, N.Y. 11322

Continuation-in-part of Ser. No. 859,870, Sept. 22, 1969, abandoned. This application June 7, 1971, Ser. No. 150,504
Int. Cl. C23f 1/02; B01k 1/00
U.S. Cl. 156—16 9 Claims

A method is disclosed for selective plasma etching an organic material. Etching is achieved by means of a low temperature plasma which reacts with the organic material through an apertured mask overlaying said material. The invention has particular application to electronic circuit fabrication. A large magnitude, alternating electric field is applied to a reaction chamber for generating an intense low temperature



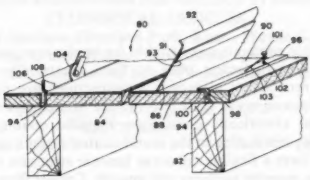
plasma in the region of the organic material. A preferred organic material is a polymer of fluorinated ethylene propylene and a suitable mask is a photoresist composition.

3,816,199

CONCEALED FASTENING OF PREDECORATED WALLBOARD

Jack A. Dawdy, Kenmore, and Daniel A. Winkowski, Tonawanda, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,442
Int. Cl. E04b 2/08
U.S. Cl. 156—71 7 Claims



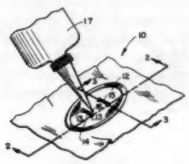
Special wallboards having predecorated facing sheets adhered except along side edges, screwed to studs along side edges, with the unadhered portion subsequently adhered over fasteners and extending into the joint between wallboards, with means provided whereby the portions between joints remain in place.

3,816,200

METHOD OF PROTECTIVELY CAPPING AND BONDING THREAD PORTIONS SECURING A BUTTON TO A GARMENT

Paul F. McKenna, 525 Bayfair Dr., Bay Village, Ohio 44140

Filed July 5, 1972, Ser. No. 269,041
Int. Cl. B32b 7/08, 3/06; D05b 3/12
U.S. Cl. 156—93 11 Claims



Threads extend through apertures of a button and into a fabric to secure the button onto the fabric. A protective abrasion-resistant cap is formed over the thread portions which cross the face of the button by applying a selected bonding agent to the thread portions. Some of the bonding agent penetrates into the threads and bonds the threads together. The remainder of the bonding agent hardens around the thread portions forming a protective cap. The bonding agent is

selected such that it will penetrate the threads only to desired degree leaving some of the bonding agent to form the protective cap and limiting the region of thread penetration such that the flexibility of the button mounting is preserved.

3,816,201

LAMINATED STRUCTURES AND METHOD OF FORMING THE SAME

Ramsey C. Armstrong, Corona Del Mar, and Herbert Hoover, III, San Marino, both of Calif., assignors to The Sierracin Corporation, Sylmar, Calif.

Division of Ser. No. 22,878, March 26, 1970, Pat. No. 3,718,535, which is a continuation-in-part of Ser. No. 634,296, April 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 575,072, Aug. 25, 1966, abandoned. This application Feb. 22, 1973, Ser. No. 334,922

Int. Cl. B32b *17/10, 31/12*

U.S. Cl. 156—106 **12 Claims**

Flexible sublaminates suitable for lamination between rigid transparent dielectric plies to form electrically powerable transparent safety glass-type constructions are prepared by first disposing on at least one surface of a carrier film a thin, adherent electrically conductive metallic coating and subsequently laminating to the metal-coated surface an interlayer film to form a flexible coherent laminar structure transparent when its exterior surfaces are smooth. Carrier films employed have an ultimate elongation of less than about 150 percent and tensile strength greater than about 5000 psi; interlayer films have ultimate elongation greater than about 150 percent and tensile strength less than about 6500 psi. Exemplary conductive metals are gold, silver, chromium, copper, and Inconel.

3,816,202

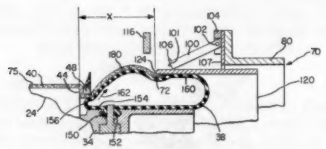
TIRE BUILDING METHOD AND MACHINE

James D. Stokes, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 800,523, Feb. 19, 1969, abandoned. This application Nov. 1, 1971, Ser. No. 194,313

Int. Cl. B24h *17/08;* **B29h** *17/22*

U.S. Cl. 156—123 **11 Claims**



A method and apparatus for building a tire including turnup of the ply endings around the tire beads onto the ply extending in cylindrical form between the beads followed by shaping of the tire carcass so formed into a toric form and applying additional components such as an inextensible belt and/or sidewall material thereto of particular advantage with ply reinforcing elements of notable stiffness. The ply endings extending outwardly beyond the beads are subjected to axial tension in a particular manner, enhancing the tightness of the endings about the beads.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,816,203

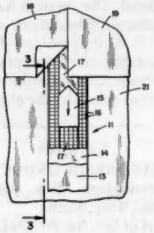
METHOD OF FACE SEAMING CARPET WITH A HOT MELT ADHESIVE CARPET SEAMING TAPE

Hollis H. Bascom; John J. Greci, both of Livermore, and Merle R. Hoopengardner, Oakland, all of Calif., assignors to Orcon Corporation, Hayward, Calif.

Filed June 1, 1972, Ser. No. 258,903

Int. Cl. B31f *5/00;* **B29c** *27/00;* **B65h** *69/02, 75/02, 81/00;* **C09j** *5/06*

U.S. Cl. 156—157 **3 Claims**



A strip of tissue wrap paper of the same width and same length as a strip of hot melt carpet seaming tape is wound into the roll of tape in a manner such that when the tape is unrolled the tissue paper is unrolled with the tape and underneath the tape. Then when the tape is positioned on the carpet underlay pad ready for face seaming with the tissue paper beneath it, any melting of the pad (resulting from the heat produced in the face seaming operation) will cause the pad to stick to the tissue, rather than to the tape. During the stretching of the carpet, the seam is free to move over the pad and cannot cause wrinkling.

The tissue paper may be lightly fastened to the back of the hot melt tape by dots of adhesive on the center line of the tape of about ⅛-inch diameter at about 3-inch intervals to insure better registration of the hot melt tape and the tissue paper. After the tissue adheres to the surface of the pad during seaming, the hot melt tape readily breaks loose from the tissue during stretching of the carpet, effectively preventing wrinkling of the pad.

3,816,204

PROCESS FOR PREPARING MATS HAVING CUSHION

Akio Nagayoshi, and Kenji Morii, both of Osaka, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and UC Sang o Company Limited, Osaka, both of, Japan

Filed Mar. 16, 1971, Ser. No. 124,709

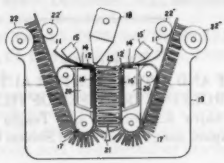
Claims priority, application Japan, Mar. 16, 1970, 45-22541

Int. Cl. D04h *3/16;* **B32b** *31/06, 31/08*

U.S. Cl. 156—167 **11 Claims**

A mat is provided having a cushion such as a plurality of bristles whose roots are forked. The mat having a cushion is prepared by extruding a melted synthetic resin from a plurality of orifices or a slit in a swinging nozzle onto a surface of a running sheet and adhering the forked roots of the bristles or

film on the sheet and cooling it to solidify the same. The extrusion of the melted synthetic resin can be made between two



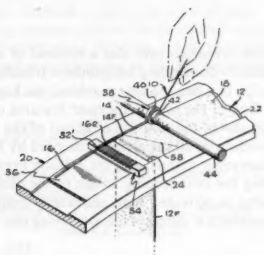
sheets through the swinging nozzle and the bristles laid between the two sheets can be sliced to separate each of the sheets.

3,816,205

METHOD FOR LAYING WIRES ON TAPE

Niels Krag, Pacific Palisades; Ernest S. Hernandez, Hawthorne, and Kalman Horvath, Lawndale, all of Calif., assignors to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.

Filed July 3, 1972, Ser. No. 268,742
Int. Cl. B32b *5/00*
U.S. Cl. 156—178 **7 Claims**



An apparatus and method for laying elongated members such as needle-wire assemblies on the adhesive side of a strip of tape so that the front ends of the needles are accurately spaced from one another across the width of the tape. A strip of tape is laid on the periphery of a wheel with the adhesive side up, and with a front end of the tape extending through an aperture to the inside of the wheel. A needle guide having numerous slots is located immediately in front of the aperture through which the tape extends. The rear end of a needle is laid in one of the slots, with the wire which extends behind the needle being held under moderate tension by a stationary wire guide spaced a small distance from the tape. The wheel is rotated by one turn so all of the wire is laid onto the tape. After the other needle-wire assemblies are similarly laid on the tape, the tape is pulled backwards so the front end is pulled out of the aperture while the needles are pulled back through the needle guide into contact with the tape.

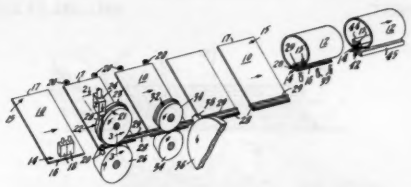
3,816,206

METHOD FOR PROTECTING RAW METAL EDGE OF INSIDE LAP OF ADHESIVELY BONDED LAP SIDE SEAM TUBULAR BODY

John Lawrence Francis Coster, Westfield, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 15, 1972, Ser. No. 234,951
Int. Cl. B29d *23/10*
U.S. Cl. 156—218 **10 Claims**

The raw metal edge of the inside lap of an adhesively bonded lap side seam of a tubular body is coated and protected from chemical attack by a corrosive substance contained within the tubular body by applying a ribbon of side seam adhesive along one marginal edge portion of the body blank, the ribbon having a fillet thereon located along its inner edge, forming the blank into tubular form, bringing the marginal portions together in an overlapping opposing relation, and pressing the marginal portions together to assemble the lap side seam in a manner such that the raw metal edge of the inside lap is pressed into a portion of the fillet and is overlapped, coated and thereby protected by that portion of the fillet.

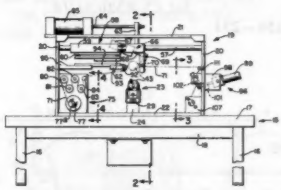


3,816,207

METHOD AND APPARATUS FOR HOT STAMPING CYLINDRICAL ARTICLES

Elmer L. Robertson, Overland Park, Kans.; Wayne G. Ritter, Jr., Freeman, and William G. Kinslow, Jr., Kansas City, both of Mo., assignors to Ethyl Corporation, Kansas City, Mo.

Filed Aug. 10, 1972, Ser. No. 279,477
Int. Cl. B44c *1/14*
U.S. Cl. 156—238 **11 Claims**



A method and apparatus for hot stamping or heat transferring an image to a cylindrical object. A cylindrical object, such as a hollow plastic bottle, is rotatably mounted on a support platform which is horizontally movable. A horizontally movable die is mounted on a frame above the bottle-holding platform. A strip of movable decorating tape is interposed between the cylindrical article and the die. Means are provided for applying fluid pressure to the interior of the bottle to rigidify the bottle during the printing step. The die moves across the decorating tape pressing the tape onto the surface of the bottle and rotating the bottle as the die moves over the tape. Gripping means are provided for gripping the tape and pulling the tape forward at the same rate of movement as the die.

3,816,208

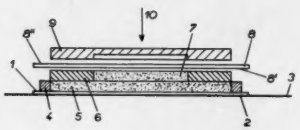
METHOD OF MANUFACTURING MOULDED ARTICLES OF WOOD PARTICLES WITH COVER SHEETS

Victor Gottlieb, 5-7, Rue de la Fontaine, Saverne, France

Filed Jan. 12, 1972, Ser. No. 217,111
Claims priority, application France, Jan. 20, 1971, 71.02425
Int. Cl. B29j *5/04*
U.S. Cl. 156—245 **2 Claims**

The disclosure is of a method of manufacturing ornamental relief panels or other moulded articles, characterised in that it

comprises the steps of coating a surface of a cover sheet (for example a veneer), placed on a support, with an adhesive without water, placing on this surface a first pre-moulding element, filling the latter with particles of wood previously dried and impregnated with adhesive without water, lightly compressing these particles, placing upon the first pre-moulding



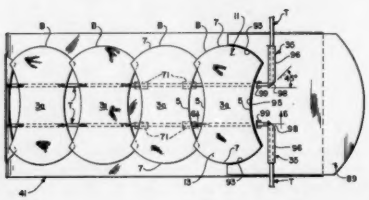
element a second pre-moulding element, likewise filling the latter with particles of wood lightly compressed in sequence, removing the two pre-moulding elements, placing upon the articles of wood an adhesive-covered surface of a second cover sheet (for example a second veneer), and finally covering the assembly with a definitive mould and subjecting it in a press to regulatable pressure and temperature.

3,816,209

SANITARY GARMENTS AND METHODS OF AND APPARATUS FOR THEIR MANUFACTURE

Irvin S. DeWoskin, St. Louis, and Murgatroyd H. Jenkins, St. Clair, both of Mo., assignors to Beltx Corporation, Barnhart, Mo.

Filed May 17, 1972, Ser. No. 254,043
Int. Cl. B32b *31/18*
U.S. Cl. 156—251 **27 Claims**



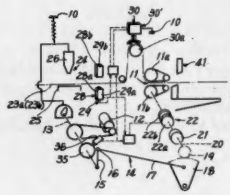
A sanitary garment having a special crotch section made of material comprising a textile fabric layer and a moisture barrier, the latter in one embodiment being a plastic coating applied to the inner face of the fabric layer, and in a second embodiment a separate layer of plastic film heat-sealed to the fabric layer, and a pair of plastic tapes heat-sealed at their ends to the moisture-barrier-side of the crotch section material adjacent the marginal side portions thereof and free of the crotch section intermediate their ends for receiving a sanitary napkin to hold it in position on the crotch section. Also, a method of manufacturing said special crotch sections involving a heat-sealing the tapes to the moisture barrier, with a variation of the method involving cutting crotch sections blanks from a web of crotch section material generally simultaneously with heat-sealing the tapes thereto. Also, apparatus for carrying out the first-mentioned method of manufacturing having an endless conveyor for moving precut blanks of the crotch section material along with the plastic tapes to a heat-sealing station at which the tapes are heat-sealed to the moisture-barrier-side of the blanks, and apparatus for carrying out the second-mentioned method having a blade for cutting crotch section blanks from a web of crotch section material at the heat-sealing station generally simultaneously with the heat-sealing.

3,816,210

METHOD OF AND APPARATUS FOR AUTOMATICALLY CONTROLLING TRANSFER OF FILMSTRIPS

Seiji Aoko; Akira Kamiyana, and Tsugio Yoshida, all of Saitama, Japan, assignors to Taiyo Shokai Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1972, Ser. No. 314,533
Claims priority, application Japan, Dec. 13, 1971, 46-100876
Int. Cl. B32b *31/00*; B65h *17/42*
U.S. Cl. 156—290 **11 Claims**



The present invention provides a method of and apparatus for automatically controlling longitudinal transfer of a plurality of film strips in a bag-making machine, packaging machine, or the like. One of the most important features of the method is that, when one of the strips goes ahead of the other strip or strips, the feeding of all the strips is stopped by braking an intermittent conveyor means, and the leading preceding strip is braked during the next feeding action of the conveyor means. The apparatus is provided with sequential control units, including photoelectric detectors, for carrying out the method.

3,816,211

METHOD FOR MAKING EMBROIDERED EMBLEM

Thomas I. Haigh, Philadelphia, Pa., assignor to The Penn Novelty Company, Philadelphia, Pa.

Division of Ser. No. 66,715, Aug. 25, 1970, Pat. No. 3,657,060.
This application Jan. 20, 1972, Ser. No. 219,263
Int. Cl. B32b *31/12, 3/02*
U.S. Cl. 156—309 **10 Claims**

An embroidered emblem which comprises a fabric base with an embroidered design thereon and a thermoplastic material laminated thereto. The emblem can be fastened to a garment by applying sufficient heat and pressure to melt the thermoplastic material. The method for preparing the laminated emblem comprises the steps of applying heat and pressure to the thermoplastic material while it is in contact with the emblem and then permitting it to cool while still under pressure. A similar technique is utilized for bonding the emblem to a garment.

3,816,212

PROCESS FOR BONDING AND FLAME PROOFING WEBS OF SYNTHETIC FIBERS

Samuel James O'Brien, Dunnellen, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 13, 1970, Ser. No. 89,531
Int. Cl. C09j 5/06; B44d 1/46, 1/09
U.S. Cl. 156—331 6 Claims

Method for forming a bonded and flame retardant non-woven web of synthetic fibers by treating a web of non-woven synthetic fibers with a thermosetting aminoplast resin, cyanamide and phosphoric acid, and thereafter heating said web at an elevated temperature.

3,816,213

PROCESS AND AGENTS FOR OPENING PAPER CONSTRUCTIONS

Nelson Whitman, Lincoln, Mass., assignor to Thor Dahl, Inc., New York, N.Y.

Division of Ser. No. 28,051, April 13, 1970, Pat. No. 3,677,460. This application Oct. 26, 1971, Ser. No. 192,607
Int. Cl. B43m 7/00
U.S. Cl. 156—344 22 Claims

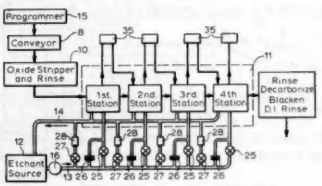
The present process is for opening paper constructions or structures, such as the marginal edges of envelopes, by treating a portion with a sensitizing agent which comprises an alkyl sodium sulfate, thereafter applying a developing agent comprising a strong organic acid to the sensitized portion, heating the developed portion to degrade it and thereafter applying mild mechanical action to remove the degraded portion.

3,816,214

RE-ETCH APPARATUS WITH CONSTANT FLOW RATE MEANS

Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 2, 1973, Ser. No. 328,980
Int. Cl. C23f 1/02
U.S. Cl. 156—345 3 Claims



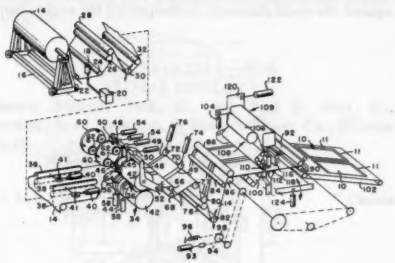
A mask etching apparatus has a succession of etching stations each including a spray means having a main valve to which etchant is supplied from a common source through a closed circulating distribution system including a supply manifold and a return manifold. Measuring devices monitor the etching process by measuring the aperture size of the mask in process and develop a control potential through which the etching time is controlled in each of the various stations. When no etching is to take place in a given station, its main valve is closed, simultaneously an auxiliary valve, which is connected in series with a fluid resistance element and is coupled between the supply manifold and return manifold, is opened. The resistance element has a resistance to fluid flow approximating that of the given etch station spray means and consequently the spray pressure at the other etching stations is maintained constant.

3,816,215

SEALED EDGE MACHINE

Charles A. Wethington, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed June 19, 1969, Ser. No. 834,843
Int. Cl. B32b 31/00
U.S. Cl. 156—366 7 Claims



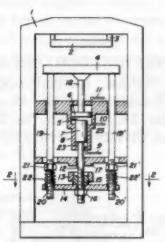
Method and machine to automatically provide severed sealed edge products to prevent unraveling. The machine is so designed to be capable of being adjusted to provide selected lengths of textile products.

3,816,216

METHOD AND APPARATUS FOR JOINING AND CUTTING SHEET MATERIALS

Masuya Takei, Osaka, Japan, assignor to Kuraray Co., Ltd., Osaka, Japan

Filed Jan. 21, 1972, Ser. No. 219,784
Int. Cl. B29c 19/02; B30b 1/34
U.S. Cl. 156—380 5 Claims



A method of working thermoplastic sheet materials employs a pair of high frequency electrodes for heating the materials, one of the electrodes having a cutting edge which is lightly applied during the heating operation to bond the sheets together, after which force is applied to sever the sheets by means of the cutting edge. Apparatus is disclosed comprising a pair of rams operative in one direction to press the pair of electrodes together initially under light force, then under pressure stored up in a compression spring and finally to sever the sheets by means of pressure exerted by one of the rams.

3,816,217

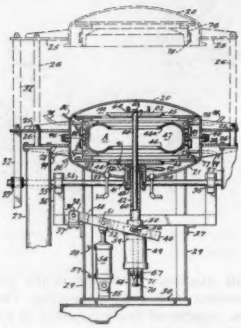
METHOD AND APPARATUS FOR RETREADING TIRES

Carlton K. Barefoot, Muncie, Ind.

Division of Ser. No. 52,534, July 6, 1970. This application Dec. 15, 1972, Ser. No. 315,677
Int. Cl. B29h 5/04, 17/36
U.S. Cl. 156—394 11 Claims

The invention is a method and apparatus for bonding and shaping retread stock to a tire casing. A pair of circum-

ferentially mating mold elements engage the tread area of a tire to be retreated. The molds are divided along a horizontal mating plane and are supported in aligned relationship within a pair of substantially hemispherical pressure chamber members adapted for closing and opening about the tire. Centering plates are provided to locate the tire concentrically within the mold and to form an internal pressure chamber within the tire. The internal pressure chamber is pressurized forcing the tire against the mold elements. Subsequently the outer chamber or



chambers are pressurized to a pressure equal to the internal pressure. The centering or bead plates are then displaced from engagement with the tire. Heat is applied for bonding and shaping the tread stock to the tire casing.

In another embodiment, elastomeric diaphragms are used as mold elements and the bead plates remain stationary relative to one another.

In still another embodiment, a combination of metal matrices and elastomeric diaphragms are used as mold elements.

3,816,218

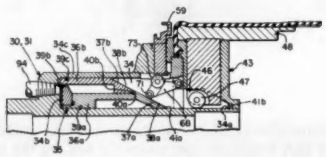
TIRE BUILDING DRUM

Gilbert A. Felten, Kehlen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 29, 1972, Ser. No. 239,145

Int. Cl. B29h *17/16, 17/22*

U.S. Cl. 156—398 **20 Claims**



A tire building machine including a drum having a set of radially movable segments at each end thereof and being covered with a cord reinforced rubber sleeve, a set of radially movable fingers are disposed adjacent the axially outer ends of the drum and an auxiliary drum including a turn-up bladder is disposed axially outwardly of each set of fingers. The drum is axially contractible and radially expansible A pair of coaxially arranged pistons each having a conical surface is associated with each set of fingers and segments on each end of the drum for moving the fingers into gripping relation with and a tire bead with a predetermined force and for moving the segments to a predetermined diameter.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,816,219

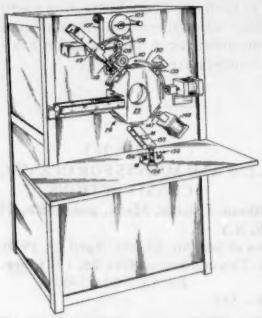
SLIDE MOUNTING MACHINE

Russell G. Hurlbut, Hilton; Donald J. Lindsay, and John C. Sproul, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,473

Int. Cl. B32b *31/00*

U.S. Cl. 156—443 **14 Claims**



A machine for automatically chopping frames from an exposed and processed film strip, nesting them individually into an open, hinged plastic mount, closing the mount and riveting it closed, and finally discharging the finished mounts in stacks corresponding to customer's orders which an operator can readily remove for packaging and return to the customer.

3,816,220

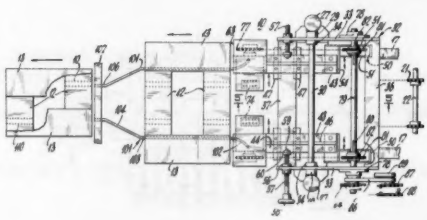
CARTON SEALER

Edward Mazur, Closter, N.Y., assignor to A. D. A. Machine Corp., Brooklyn, N.Y.

Filed May 15, 1972, Ser. No. 253,313

Int. Cl. B65d *5/06*

U.S. Cl. 156—486 **11 Claims**

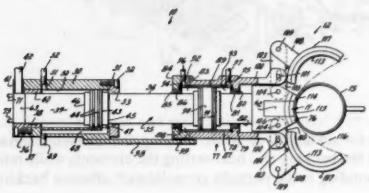


A machine for sealing the closure and dust flaps of a carton includes an endless conveyor for advancing the cartons with the closure flaps open and the dust flaps closed. A frame is supported for rocking about a transverse axis above the advancing cartons and carries a pair of transversely spaced transversely adjustable glue-applying devices at one end and a counterweight at the other end so that the gluing devices are normally depressed to an adjustable level slightly below the dust flaps. Each gluing device includes a liquid glue tank having a bottom opening and a glue applicator roll registering with and depending below the opening and having glue transferring wells in its outer face. The rolls are rotated about a transverse axis at a peripheral speed about equal to the conveyor speed. Following the glue applicators are guides for closing the closure flaps against the dust flaps and an upper belt for maintaining them in a closed position during the setting of the glue.

3,816,221
WRAP AROUND DECORATION APPLYING APPARATUS

Herbert Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed May 10, 1972, Ser. No. 252,045
Int. Cl. B65c 9/14
U.S. Cl. 156—492 10 Claims



An apparatus for placing a decoration such as a decal, on a rounded article, for example a coffee mug, drinking glass, cup or the like. A picker removes a decal from a supply and extends to a position at which a portion of the decal is in contact with the exterior sidewall surface of the article to be decorated. Wrapper means mounted on the picket support are then energized to wrap the remaining portions of the decal into contact with the article sidewall surface.

3,816,222
METHOD FOR PREPARING VITREOUS BODY BY DIFFUSION OF IONS THROUGH A COATING LAYER

Emile Plumat, Gilly, and Francois Toussaint, Lodelinsart, both of Belgium, assignors to Glaverbel S.A., Watermail, Belgium

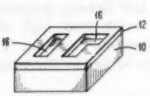
Continuation of Ser. No. 724,597, April 26, 1968, abandoned. This application Aug. 2, 1971, Ser. No. 168,491
Claims priority, application Luxembourg, Apr. 27, 1967, 53536
Int. Cl. C03c 15/00; C03b 29/00; B44f 1/00
U.S. Cl. 161—1 34 Claims

A process, and a body treated in accordance therewith, for adding a layer to a body of vitreous, vitrocrystalline or ceramic material which layer is subsequently at least partially crystallized. Ions are diffused into the body and through this layer.

3,816,223
FABRICATION MASK USING RARE EARTH ORTHOFERRITES

Kie Y. Ahn, San Jose, Calif., and Jerome J. Cuomo, Bronx, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,251
Int. Cl. G02b 5/22
U.S. Cl. 95—1 R 10 Claims



A mask for the manufacture of semiconductor and various small components. Rare earth orthofertites, such as $GdFeO_3$, as well as $YFeO_3$, and $LaFeO_3$ comprises the masking material. Rare earth combinations, such as $(Gd, Eu)_1FeO_3$, can also be used for the masking material. This masking material is harder than the components being manufactured and is opaque to the wavelength used in photoresist techniques while being transparent to visible wavelengths over broad thickness ranges. The mask can comprise a patterned layer on a substrate or patterned bulk crystals having regions of different thickness. Substrates such as soda-lime glass, sapphire, quartz, etc. are suitable. The masking material can be deposited as large area films having good uniformity and good optical properties. The material is readily etched but is not attacked by materials used in photoresist processing. Its reflectivity is very low, thereby providing easy alignment and good image defination during use.

3,816,224
FLORAL DISPLAY

Ted Smart, Melrose Park, Ill., and Paul R. Witt, Jr., Muscatine, Iowa, assignors to Bowl-O-Beauty Co., Melrose Park, Ill.

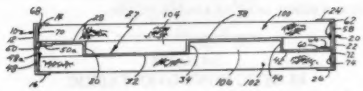
Filed Dec. 19, 1972, Ser. No. 316,475
Int. Cl. A01n 3/00
U.S. Cl. 161—26 7 Claims

An ornamental plant display system for prolonged display of a natural plant with its internal chemical structure and moisture content substantially unaltered comprising a transparent water-tight container for encompassing the plant, a plant coated with an opaque waterproof inert coating, such as composed of a blend of paraffin, mineral oil and an appropriate dye, a plastic support means for the plant and a transparent aqueous liquid within the container encompassing the plant having a pH value of about 4.2 to 4.4. and not more than 1 percent of a heavy metal sequestering agent. The pH value is attained by additions of sodium bisulfite and the sequestering agent is preferably sodium ethylene diamine tetraacetic acid. Benzophenone sunlight-absorbing agents may be included within the plant coating material to prevent bleaching or the like of plant colors.

3,816,225
ACOUSTICAL PANEL ASSEMBLY AND METHOD OF FORMING IT

Oliver C. Eckel, 75 Grave St. Apt. 431, Weston, Mass. 62181

Filed July 26, 1972, Ser. No. 275,330
Int. Cl. B32b 3/02; E04b 2/58
U.S. Cl. 161—43 10 Claims



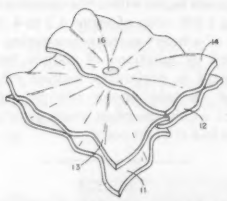
An acoustical panel assembly has two channel members at oppositte sides each having a face portion and two flanges extending from opposite extremities thereof, thereby providing a channel between each set of flanges. A septum extends between the channel members being joined to said face portions intermediate each set of said flanges so that each channel member provides two channels to receive sound insulating material which may be in the shape of thin boards or packs. At the top and bottom are covers which close my panel assembly.

A method of forming the assembly first provides the septum with reinforcing means which are joined to the channel member face portions.

3,816,226
FIRE PROTECTION MATERIAL
Thomas M. Finelli, North Andover, Mass., assignor to Avco Corporation, Cincinnati, Ohio
Filed Mar. 31, 1972, Ser. No. 240,102
Int. Cl. B32b *3/06*
U.S. Cl. 161—48 **8 Claims**

The invention is directed to a composite laminate material for physically isolating a protected surface from a fire. Fire resistance in the form of ablation and/or fire retardation may be incorporated. One layer of the composite is compressed and expands to its normal configuration when heated. An intumescent coating is applied to the exterior of the compressed layer. The intumescent coating also expands when heated. A protected surface is protected by the expanded thickness of both layers of the composite.

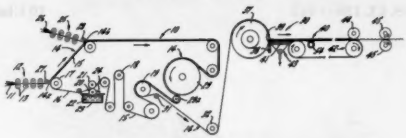
3,816,227
EXPANDABLE ARTICLE
Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Continuation-in-part of Ser. No. 41,377, May 28, 1970, abandoned. This application Mar. 26, 1971, Ser. No. 128,267
Int. Cl. B32b *3/06*
U.S. Cl. 161—49 **4 Claims**



Expandable articles comprising flat interleaved sheets of bendable material some portions of which overlap, and fastening means securing the sheets together in the overlapping portions without obstructing relative movement of the remaining portions of the sheets to bend the unfastened positions of the sheets independently of each other and bulk the article. The bulked article can function as a diaper, wipe or other absorbent, or as a pillow or other kind of spacer.

3,816,228
ELASTIC NONWOVEN FABRIC
Robert J. Stumpf, Appleton, Wis, assignor to Kimberly-Clark Corporation, Neenah, Wis.
Division of Ser. No. 820,224, April 29, 1969, Pat. No. 3,687,754, which is a continuation-in-part of Ser. No. 769,959, Oct. 23, 1969, abandoned. This application July 19, 1972, Ser. No. 273,040
Int. Cl. D04h *11/00*
U.S. Cl. 161—63 **9 Claims**

An elastic, high-loft nonwoven fabric with a discontinuous backing layer of adhesive and a multiplicity of heat-set elements looped outwardly from the backing and a method of making the fabric by first embedding a web of elements in an open pattern of adhesive, partially consolidating the adhesive



into a backing layer while looping the elements outwardly from the backing and heat-setting the elements while minimizing bonding in the partially consolidated adhesive backing.

3,816,229
PLURAL COATED PILE FABRIC
Chester J. Bierbrauber, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 14, 1972, Ser. No. 218,024
Int. Cl. B32b *7/04*
U.S. Cl. 161—67 **3 Claims**

Process for treating pile fabrics with fluoroaliphatic radical containing compositions in two steps to provide enhanced dry soil resistance and minimize stain bloom, and the treated pile fabrics from the process. The first treatment covers the pile substantially completely, and the second coating, which may comprise organic or inorganic adjuvants, is applied to the outer 25 percent or less of the pile.

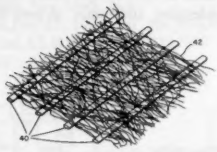
3,816,230
PROTECTIVE CONTAINER COMPRISING HEAT SEALABLE LAMINATE
Edmond J. Carreras, Media, and Irving H. Custis, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 2, 1973, Ser. No. 329,282
Int. Cl. D06q *1/04*
U.S. Cl. 161—89 **8 Claims**

A flexible container having a heat sealable laminated structure with layers of low density polyethylene face film, aluminum foil, nylon mesh and high density spun bonded polyethylene with aluminum coating. This laminate forms a rugged container providing environmental protection for enclosed articles.

3,816,231
REINFORCED NONWOVEN FABRICS
Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Walpole, Mass.
Filed May 25, 1972, Ser. No. 256,711
Int. Cl. D04h *5/00*
U.S. Cl. 161—141 **6 Claims**

Textile-length fibers are subjected to a centrifugal force

which orients them in a lateral direction, in which orientation



they are deposited upon and mechanically engaged with a set of spaced-apart warp strands to form novel nonwoven fabrics.

3,816,232

DECORATED MOLDED ARTICLE AND METHOD OF PRODUCING IT

Kenneth D. Meiser, Dallas, Tex., assignor to Plastics Manufacturing Company, Dallas, Tex.

Continuation-in-part of Ser. Nos. 826,694, May 21, 1969, abandoned, and Ser. No. 157,011, June 25, 1971, abandoned.
This application Feb. 28, 1973, Ser. No. 336,411
Int. Cl. B32b *27/10*
U.S. Cl. 161—146 **4 Claims**

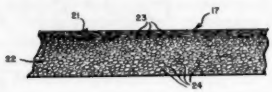
A decorated molded article is produced by preparing an assembly including a molding composition comprising a cellulose filler, a surface sheet of unpigmented paper, and an underlying sheet of paper, both of said sheets and the cellulose filler being impregnated-with 1 ½ to 3 times their weight of thermosetting melamine-formaldehyde resin. A decorated sheet of a dense, filled paper unimpregnated with resin is interposed between the surface sheet and the underlying sheet, and the assembly is consolidated under heat and pressure to bond it into a decorated article of excellent quality.

3,816,233

MANUFACTURE OF URETHANE FOAM SHEETS

William R. Powers, Penns Grove, N.J., assignor to Specialty Converters, Inc., Newark, Del.

Continuation of Ser. No. 77,115, Oct. 1, 1970, abandoned.
This application Dec. 14, 1972, Ser. No. 315,016
Int. Cl. B32b *5/14, 5/20, 3/26*
U.S. Cl. 161—159 **6 Claims**



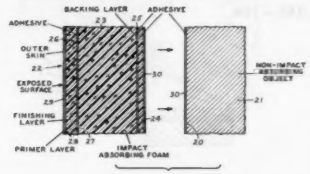
This invention relates to a novel, porous integral polyurethane sheet wherein one side of the sheet, is of a high density, porous structure and the body of the sheet is a low density, open cell urethane foam. The invention provides a method of making such sheet which comprises differentially heating at least one side of a cast sheet of polyurethane foam mix relative to the body thereof during expansion, then compressing the expanded differentially heated, partially cured foam structure to achieve differential compression and a high density structure on the heated side.

3,816,234

IMPACT ABSORBING LAMINATE AND ARTICLES FABRICATED THEREFROM

Armand Gordon Winfield, Copiague, N.Y., assignor to William A. M. Burden, New York, N.Y.

Filed Mar. 22, 1971, Ser. No. 126,421
Int. Cl. B32b *3/26, 5/18*
U.S. Cl. 161—160 **8 Claims**



The laminate comprises (i) a layer of impact absorbing foam, (ii) a flexible, resinous finishing layer affixed to the foam layer, and (iii) a continuous, flexible thin layer of a substantially water impermeable resin affixed to the finishing layer. In one embodiment, impact absorbing polypropylene or polyethylene foam is provided with a finishing layer of either a cross-linked polyethylene ionomeric foam or a mixture of a ground impact absorbing foam dispersed throughout an acrylic resin binder. A thin vinyl or acrylic resinous layer is affixed to the finishing layer to complete the laminate. The laminate is rigidified by affixing a stiff, self-supporting backing layer, such as a reinforced polyester or epoxy resin, to the impact absorbing foam to sandwich the foam between the backing and finishing layer.

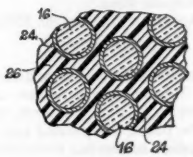
Numerous impact absorbing articles such as walls, floors, ceilings, bathtubs, swimming pools, sinks, shower stalls, can be fabricated from the laminate. Pre-existing surfaces are rendered impact absorbing by covering such surfaces with the laminate. In addition to the safety feature arising frpm its impact absorbing properties, the laminate is water resistant, easy to clean and maintain, substantially dent resistant, of light weight, and attractive to the eye.

3,816,235

GLASS FIBER SIZE COMPOSITION

Kingso C. Lin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 18, 1972, Ser. No. 281,685
Int. Cl. D06m *11/00*
U.S. Cl. 161—175 **24 Claims**



This invention is addressed to an improved size composition for use in the treatment of glass fibers in the manufacture of glass fiber textiles, glass fiber reinforced plastics and glass fiber reinforced elastomeric products wherein the size is formulated to contain, as the essential components, a water-soluble resin formed of maleic anhydride and a conjugated diene, an alkyl acrylate or methacrylate, or a vinyl aromatic monomer, and a glass fiber anchoring agent. Bundles of glass fibers sized with the composition of the invention are particularly well suited for impregnation with an elastomer compatible material containing a resorcinol-aldehyde resin com-

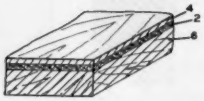
ponent and an elastomer component for use in the manufacture of glass fiber reinforced elastomeric products.

3,816,236

CROSS-BANDING MATERIAL FOR WOOD VENEERS

John W. Baymiller, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 27, 1971, Ser. No. 212,039
Int. Cl. B32b *23/08, 23/10, 27/42*
U.S. Cl. 161—188 **2 Claims**



A veneered or laminated board structure is conventionally made of a wood core which has a surface covering made of a cross-banding material and then this is followed by a wood veneer finish layer. Herein, the cross-banding material is made from a porous felt sheet containing uncatalyzed urea-formaldehyde resin. The adhesive which is applied to the felt sheet to glue it to the wood core and veneer layer contains a catalyst. During the laminating process, the catalyst of the adhesive catalyzes the urea-formaldehyde resin in the cross-banding material.

3,816,237

OPTICALLY INACTIVE MAGNETO-OPTIC SUBSTRATE

Edward Martin Barrall, San Jose, and Kenneth Lee, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,865
Int. Cl. G11b *11/10*
U.S. Cl. 161—227 **15 Claims**

The use of poly(parabanic acids) as a substrate for magneto-optic data storage applications. For example. the substrate is characterized by having optical inactivity and may be made free of stress induced dichroism and birefringence, thus being particularly suitable for use with magneto-optic storage films where information stored is read by utilizing the Kerr or Faraday effects.

3,816,238

PROCESS FOR REMOVING POLYMERIC BINDERS FROM NONWOVEN FABRICS

Philip A. Mitchell, East Walpole, Mass., assignor to The Kendall Company, Walpole, Mass.

Filed Apr. 30, 1973, Ser. No. 355,959
Int. Cl. D21c *5/02*
U.S. Cl. 162—8 **3 Claims**

Certain copolymers of vinyl acetate and acrylic esters, used to bond fibers to form nonwoven fabrics, can be removed from such fabrics by an alkaline treatment, without degradation of the fiber. The fibers, in separated and unbonded form, may then be reprocessed into webs.

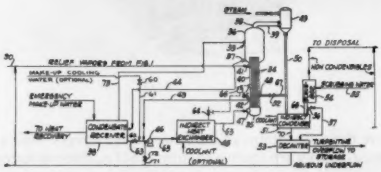
3,816,239

RECOVERY OF TERPENES

Robert Elliott Marks, Jacksonville, Fla., assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Mar. 12, 1971, Ser. No. 123,549
Int. Cl. D21c *11/06*
U.S. Cl. 162—15 **2 Claims**

Disclosed is a method for recovering terpenes from a wet, gaseous stream containing terpene vapor and water vapor by condensing water from the stream by indirect heat exchange to produce an aqueous liquid terpene-lean condensate phase while leaving a first terpene-rich vapor phase. The aqueous terpene-lean condensate is disengaged from said vapor phase, subcooled and used as the indirect heat exchange medium at boiling for condensing additional terpene-lean condensate



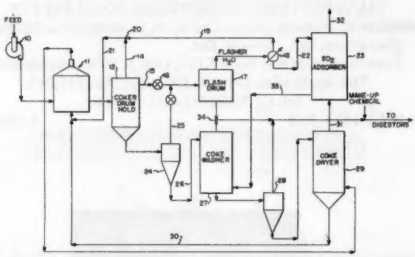
from the wet, gaseous stream. During this indirect heat exchange, a portion of the terpene-lean condensate is flash vaporized; and these distillate vapors are combined with the first terpene-rich vapor phase for recovery of terpenes therefrom by condensation at a temperature below the dew point temperature of the terpene component.

3,816,240

MINIMIZING SULFUR OXIDATION IN PULPING LIQUOR RECONSTITUTION

William F. Franz, Gardiner; Howard V. Hess, Glenham, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 21, 1972, Ser. No. 265,099
Int. Cl. D21c *11/02, 11/06, 11/14*
U.S. Cl. 162—31 **4 Claims**



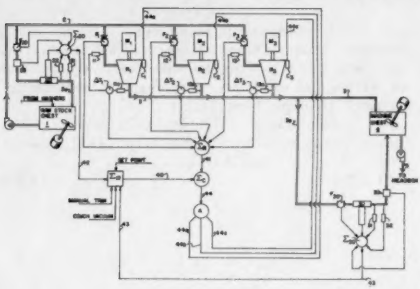
Disclosed is an improved process for the liquid phase coking of spent wood pulping liquors wherein a part of the decoked effluent is flash vaporized to supply condensate for SO_2 absorption, thus eliminating the need to absorb SO_2 from an oxygen-containing flue gas into sulfite ion-containing coker effluent, thereby minimizing sulfite ion oxidation and reducing the amount of make-up chemicals required to reconstitute the pulping liquor.

The process is applicable to all acid sulfite pulping processes employing metallic ions such as sodium, calcium, magnesium, to ammonia-base sulfite and alkaline sulfite pulping liquors.

3,816,241
METHOD AND APPARATUS FOR FEED-FORWARD CONTROL OF WOOD PULP REFINERS

William M. Blume, Charleston Heights, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed July 25, 1972, Ser. No. 274,999
Int. Cl. D21b *1/14*; D21f *7/00*
U.S. Cl. 162—198 **19 Claims**



Method and apparatus for producing wood pulp stock having substantially constant drainage characteristics from raw stock, that is drainage rate variable, by making a laboratory determination of the functional relationship between drainage rate and refiner applied specific energy for the desired stock furnish. Using the functional relationship to coordinate signals from a continuous or rapidly cycling drainage rate measurement meter on the raw stock line as an automatic, feed-forward set-point control to a stock refiner control system, where the control system is capable of altering the magnitude of specific energy applied to the stock so as to accommodate the set-point as a variable reference standard.

3,816,242
PROCESS FOR PRODUCING BORON NITRIDE FELT

Theodore B. Selover, Shaker Heights; Robert A. Rightmire, Northfield, and Philip R. Regan, Woodmere, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 17, 1972, Ser. No. 244,869
Int. Cl. D21h *5/18*
U.S. Cl. 162—157 R **4 Claims**

A novel process for producing a thin flexible self supporting boron nitride felt comprising the following steps.

A. purifying boron nitride fiber by washing with water and subsequently extracting with an aliphatic alcohol containing from 1 to 3 carbon atoms

B. forming a mat from the fibers in step H and incorporating there in an aqueous solution of an inorganic water soluble binder selected from the group consisting of water soluble halides, nitrates, nitrites and carbonates of the alkali metals, the alkaline earth metals, the Group III A metals and their mixtures; and

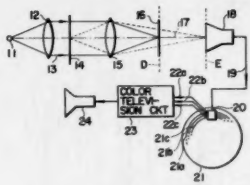
C. drying the resulting binder containing mat obtained from step (B) at a temperature below the melting point of the salt.

3,816,243
HOLOGRAM RECONSTRUCTION SYSTEM

Seiji Yonezawa, Hachioji; Akiyoshi Iyama, Sagamihara; Hisatsugu Ito, and Keizo Kato, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1973, Ser. No. 335,297
Claims priority, application Japan, Feb. 23, 1972, 47-18079
Int. Cl. H04n *9/02*
U.S. Cl. 178—5.4 CD **15 Claims**

A hologram reconstruction system employs a hologram with a color picture recorded thereon, on which a collimated beam generated from a laser source is illuminated and a lens converges transmitted beams of the hologram. A rotary disc having sectorial slits is disposed at the back focal plane of the lens, and a camera tube converts the diffraction beams of respective components of red, green and blue derived through the

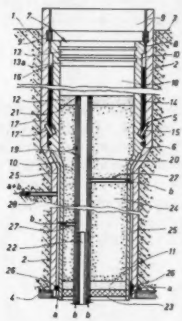


slits of the rotary disc in the form of black and white densities into video signals. A magnetic head records the output signals from the camera tube on a magnetic disc, whereby the recorded electric signals are read out through the magnetic head from the magnetic disc, to reconstruct a color image in conformity with the NTSC system.

3,816,244
PROCESS FOR OPERATING A GAS-COOLED NUCLEAR REACTOR WITH A STANDPIPE PLUG HAVING COOLANT FLOW THERE THROUGH

Wilfried Stracke, Oberehrendingen, Switzerland, assignor to Brown Boveri & Company Limited, Baden, Switzerland

Filed Aug. 17, 1972, Ser. No. 281,499
Claims priority, application Switzerland, Oct. 15, 1971, 15097/71
Int. Cl. G21c *15/14, 15/22, 19/20*
U.S. Cl. 176—60 **3 Claims**



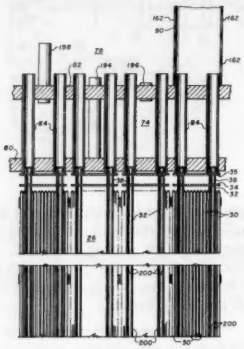
A method of operating gas-cooled nuclear reactor which is refuelled through the opened standpipe located in the reactor vessel, the standpipe and plug being provided with a cooling system and the plug accomodating the control-rod drive and incorporating a guide tube through which the control rod can be introduced into and withdrawn from the reactor core, in which method the plug is supported with cold gas corresponding to the cooling gas of the reactor, such that a primary flow ("a") of cold gas removes heat from the plug and a secondary flow ("b") of cold gas removes heat from the control rod guide system and both flows are passed to the reactor core, the pressures of the primary ("a") and secondary ("b") flows being at least as high as is the highest gas pressures in the reactor core.

3,816,245

EMERGENCY CORE COOLANT SYSTEM UTILIZING AN INACTIVE PLENUM

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 27, 1972, Ser. No. 266,804
Int. Cl. G21c 9/00, 15/18, 15/22
U.S. Cl. 176—61 6 Claims



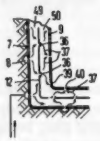
An emergency core coolant system for cooling the nuclear core of a nuclear reactor. A storage tank having a supply of coolant fluid therein is positioned outside of the reactor vessel and communicates through conduit means to an inactive plenum within the reactor vessel. Two distribution means are provided within the reactor vessel to flow couple the inactive plenum to the nuclear core, the two distribution means communicating with the inactive plenum at two different vertical elevations. Normally closed valve means is interposed in the conduit means and is operable to be opened in the event of an emergency to introduce coolant fluid in the tank means into the inactive plenum. The coolant fluid in the inactive plenum is then distributed to the nuclear core by the two distribution means.

3,816,246

CONCRETE PRESSURE VESSEL FOR PRESSURIZED OR BOILING-WATER NUCLEAR REACTORS

Hermann Kumpf, Wendelstein, Germany, assignor to Kraftwerk Union Aktiengeselischaft, Milheim (Ruhr), Germany

Filed Mar. 17, 1972, Ser. No. 235,590
Claims priority, application Germany, Mar. 20, 1971, 2113672
Int. Cl. G21c 15/10, 15/12, 15/26
U.S. Cl. 176—65 2 Claims



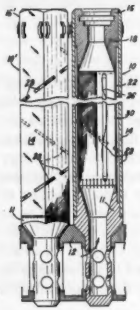
Concrete pressure vessel for a pressurized or boiling-water nuclear reactor includes a cool sealing wall engaging the inner surface of the concrete pressure vessel, a hot inner wall surrounding the reactor and spaced from said cool sealing wall, and at least one intermediate wall disposed between said cool sealing wall and said hot inner wall substantially parallel and in spaced relationship thereto, said intermediate wall being formed with a limited number of passage openings therethrough for conducting coolant flows from the space between said intermediate wall and said cool sealing wall to the space between said intermediate wall and said hot inner wall.

3,816,247

NUCLEAR FUEL ASSEMBLY, ESPECIALLY FOR A FAST REACTOR

Andre Cayol, Montrouge; Jean-Claude Chenal, Aix en Provence; Georges Clottes, Manosque; Karl Schaller; Jean Skok, both of Aix en Provence, and Henri Venobre, Vinon sur Verdon, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed May 30, 1972, Ser. No. 257,549
Claims priority, application France, May 7, 1971, 71.16633
Int. Cl. G21c 3/32
U.S. Cl. 176—78 7 Claims



The fuel assembly comprises at least one bundle of parallel fuel pins disposed on a uniform lattice within a pressure-resistant outer prismatic sleeve which has a polygonal cross-section and through which a coolant is circulated.

Curvature of the sleeve produced by swelling under intense irradiation is limited by means of slots which are cut across the dihedrons formed by the sleeve faces.

A thin-walled jacket which guides the coolant flow within the fuel bundle and withstands vertical handling stresses is placed between the bundle and the sleeve with provision for a clearance which permits expansion of the jacket under the action of differential pressure.

3,816,248

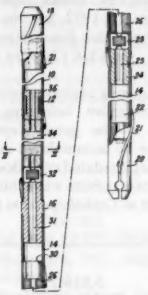
NUCLEAR FUEL PIN

Andre Cayol, Aix-en-Provence; Georges Clottes, Manosque, and Jean-Louis Ratier, Aix-en-Provence, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed June 16, 1971, Ser. No. 153,648
Claims priority, application France, June 19, 1970, 70.22835
Int. Cl. G21c 3/06, 3/04, 3/28
U.S. Cl. 176—81 4 Claims

A nuclear fuel pin for a fast reactor comprising a can closed by end-plugs and containing a column of pellets of fissile material, the fuel pin being fitted with a spacer wire which is helically wound on the can and the extremities of which are attached to the end-plugs. The diameter of the can section

which contains the fissile material is substantially constant along its entire length and slightly smaller than the diameter of



the terminal portions which carry the end-plugs, the length of each terminal portion being at least equal to one-half the winding pitch of the spacer wire.

3,816,249

UNIVERSAL MEDIUM AND METHOD FOR EXTENDING THE USEFUL LIFE OF SEMEN IN VITRO

Bhairab C. Bhattacharya, Omaha, Nebr.

Continuation-in-part of Ser. No. 92,226, Nov. 23, 1970, abandoned. This application Feb. 28, 1973, Ser. No. 336,454

Int. Cl. C12b *1/00, 3/00*

U.S. Cl. 195—1.8 **22 Claims**

A universal medium for extending the useful life of semen, in vitro, is provided comprising, in effective amounts, egg yolk, α-aminopropionic acid, and glycine. If the semen is to be stored for long periods of time at reduced temperature it is preferred that glycerol and an ionizable salt, such as sodium chloride, be utilized in the medium. The medium has general utility for extending the life of semen from all types of mammals and birds and is especially valuable for extending the useful life of sensitive types of semen, such as turkey semen. Such sensitive types of semen can now be kept viable until they can be frozen. The invention provides for storage by freezing of types of semen which have not before been successfully frozen.

3,816,250

METHANE OXIDIZING BACTERIAL STRAIN M 102, A METHOD FOR OBTAINING IT AND A METHOD FOR SYNTHESIZING PROTEIN WITH IT

Jurgen Overbeck, and Monir Naguib, both of Plon/Holstein, Germany, assignors to Max-Plank Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Sept. 15, 1971, Ser. No. 180,732

Claims priority, application Germany, Sept. 15, 1970, 2045589; Apr. 29, 1971, 2121212

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R **2 Claims**

The methane oxidizing bacterial strain "M 102" in the form of a highly active pure culture negative as regards Gram staining, acid fast staining, spore staining, flagellae staining, and capsule staining, forms micro-colonies on mineral agar nutrient media which are invisible for the naked eye but can be detected microscopically and is capable of converting, on a dry matter basis, 1 part by weight of methane into approximately 0.8 part by weight of bacterial substance.

3,816,251

PROCESS FOR PRODUCING ADENOSINE-3,5 -CYCLIC MONOPHOSPHORIC ACID BY FERMENTATION

Kiyoshi Nakayama, Sagamihara; Akira Furuya, Kawasaki, and Masayo Ukita, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1972, Ser. No. 243,869

Claims priority, application Japan, May 7, 1971, 46-29803; May 7, 1971, 46-29804

Int. Cl. C12d *13/06*

U.S. Cl. 195—28 N **8 Claims**

Adenosine-3′,5′-cyclic monophosphoric acid is produced by fermentation of a nutrient medium, containing a fluoride, by a microorganism which is capable of producing the nucleotide. The adenosine-3′,5′-cyclic monophosphoric acid is accumulated in the culture medium and is thereafter recovered therefrom.

3,816,252

PROCESS FOR THE PRODUCTION OF MICRO-ORGANISMS

Francis Moran, Surrey, England, and Philip Albert Myers, Rambouillet, France, assignors to The British Petroleum Company Limited, London, England

Filed Aug. 22, 1972, Ser. No. 282,691

Claims priority, application Great Britain, Aug. 24, 1971, 39599/71; Feb. 17, 1972, 7348/72

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R **11 Claims**

A continuous process for converting methane into proteinaceous materials wherein a methane utilising micro-organism, preferably Methylococcus casulatus is cultivated continuously under steady state conditions at a production rate of at least 0.81 (dry weight) of micro-organism per litre hour in an aqueous broth containing nutrient salts and ammonium ions, in the presence of methane and a gas containing free oxygen, adding an aqueous nutrient medium to the broth and maintaining the broth pH in the range 4.5 to 8.0 and the ammonium ion concentration in the range 2 to 100 milligrams per litre.

3,816,253

METHOD FOR THE PRODUCTION OF CEPHALOSPORINS

Takeshi Takahashi; Yoshio Yamazaki, both of Osaka; Koichi Kato, Kobe, and Masao Isono, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

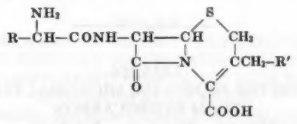
Filed Mar. 31, 1972, Ser. No. 240,285

Claims priority, application Japan, Apr. 2, 1971, 46-20586

Int. Cl. C12d *9/00*

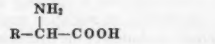
U.S. Cl. 195—29 **17 Claims**

Cephalosporins of the formula



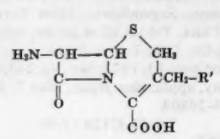
(I)

wherein R stands for a six-membered cyclic hydrocarbon residue or a five-membered heterocyclic residue and R′ stands for a hydrogen atom or an organic radical the indicated linkage of which is that between the methylene carbon atom and an oxygen, sulfur or nitrogen atom composing the organic radical, are produced by condensation between (1) an α-substituted-α-amino acid of the formula



(II)

wherein R has the aforementioned significance, or its reactive derivative and (2) a 7-aminocephem compound of the formula



(III)

wherein R' has the aforementioned significance through the utilization of a microorganism having a novel type of enzymatic activity. The compounds have strong antibacterial action against gram-positive and gram-negative bacteria.

3,816,254

OPTICAL RESOLUTION OF RACEMIC AMINO ACIDS

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto; Tadashi Sato, Takatsuki, and Takao Mori, Suita, all of Japan, assignors to Tanabe Seiyake Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 109,554, Jan. 25, 1971, abandoned. This application Dec. 14, 1972, Ser. No. 314,967

Claims priority, application Japan, Feb. 3, 1970, 45-9789

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **17 Claims**

Mold acylase is treated with a substantially water insoluble haloacetyl-polysaccharide. The resultant substantially water-insoluble mold acylase preparation is incubated with a solution of an alpha-N-acyl derivation of a racemic acid. Free L-amino acid forms.

3,816,255

PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION

Kazunobu Tanno, 19-5-2 Takasuzucho, and Yoichi Ikeno, 5 Naka Narusawacho 1 Chome, both of Hitachi-shi, Japan

Filed May 1, 1972, Ser. No. 249,344

Claims priority, application Japan, May 12, 1971, 46-31151; Sept. 1, 1971, 46-66579

Int. Cl. C12d *13/06*

U.S. Cl. 195—30 **8 Claims**

L-lysine is produced by cultivating *Brevibacterium divaricatum* HC-615 (FERM-P No. 928; ATCC No. 21792) or *Corynebacterium lilium* HC-B020 (FERM-P No. 973; ATCC No. 21793) in a medium containing 10 percent (W/V) benzoic acid in the form of ammonium salt as a carbon source at 20° to 37°C and a pH of 5 to 9 for 48 to 96 hours under aerobic conditions without any amino acid requirement, forming and accumulating L-lysine therein, and recovering the same from the resulting culture broth.

3,816,256

PROCESS FOR PRODUCING MICROBIAL PROTEIN FROM HYDROCARBON

Katsuhide Murata; Masaharu Takahataka, both of Ichibarashi; Kazuo Kakutani, and Sigezo Uedono, both of Osaka, all of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1972, Ser. No. 315,442

Int. Cl. C12d *13/00*

U.S. Cl. 195—30 **1 Claim**

Process for producing microbial protein from hydrocarbons wherein a microorganism is cultured in a carbon source obtained by saponifying an oxidation reaction product obtained by liquid phase oxidation of the hydrocarbons.

3,816,257

METHOD FOR PRODUCING CEPHALOSPORIN C

Togo Yamano, Nara; Toshihiko Kanzaki; Haruo Suide, and Keisuke Tsubaki, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 15, 1972, Ser. No. 306,863

Claims priority, application Japan, Nov. 15, 1971, 46-91390

Int. Cl. C12d *9/04*

U.S. Cl. 195—36 R **5 Claims**

A method for producing cephalosporin C, which comprises culturing a microorganism belonging to a hitherto undiscovered species of the genus *Cephalosporium* so that cephalosporin C may be accumulated in the culture medium, then recovering so accumulated cephalosporin C from the culture broth. Thus, a new species was established by the present inventors and named as *Cephalosporium polyaleurum*.

3,816,258

PROCESS FOR PRODUCING L-HISTIDINE BY FERMENTATION

Yukou Arai, and Fumio Kato, both of Shizuoka-ken, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 12, 1972, Ser. No. 243,440

Claims priority, application Japan, Apr. 14, 1971, 46-23044

Int. Cl. C12d *1/02*

U.S. Cl. 195—47 **11 Claims**

A process for producing L-histidine by fermentation using a microorganism capable of producing L-histidine, characterized in that the microorganism is cultured in a medium containing a growth-inhibiting agent.

3,816,259

THERMOSTABLE LACTASE

Alfred E. Collinge, Churchville; Clifford E. Neubeck, Hatboro, both of Pa., and John R. Udinsky, Palmyra, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 123,857, March 12, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,997

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 **5 Claims**

Thermostable lactase is obtained from a carbohydrate nutrient, typically lactose, by aerobic incubation using a *Streptomyces coelicolor*. The resulting lactase exhibits high thermal stability useful where relatively higher temperatures of enzymatic activity are required.

3,816,260

BACTERIAL CELLWALL LYTIC ENZYME AND PROCESS FOR PRODUCING THE SAME

Shinichi Sugiyama, Nagareyama, Japan, assignor to Kikkoman Shoya Co., Ltd., Noda-shi, Japan

Filed Mar. 28, 1972, Ser. No. 238,768

Claims priority, application Japan, Mar. 29, 1971, 46-17889

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 **8 Claims**

A bacterial cellwall lytic enzyme having an ability to dissolve bacterial cellwalls; an optimum pH of 7.0 to 8.0, an optimum temperature of 37° to 40° C and a heat stability being lost at 60° C for 30 minutes for gram-positive bacteria of the genera *Staphylococcus, Micrococcus, Bacillus, Corynebacterium* and Lactobacillus; an optimum pH of 7.0 to 8.0, an optimum temperature of 40° to 45° C and a heat stability being kept 80 percent at 60° C for 30 minutes for gram-negative bacteria of the genera *Psudomonas, Proteus, Erwinia, Arthrobacter, Achromobacter, Escherichia, Aeromonas* and *Xanthomonas;* and a residual activity being 45.8 percent in a 10 percent, sodium chloride solution, is produced by cultivat-

ing a microorganism belonging to the genus *Pseudomonas* and being capable of producing the bacterial cellwall lytic enzyme from a non-carbohydrate carbon source, for example, hydrocarbons, alcohols, and organic acids, for example, *Pseudomonas aeruginosa* L-1028, FERM-P 788, ATCC 21776, in a medium containing 1 to 5 percent (W/V) of at least one of the non-carbohydrates under aerobic conditions, forming and accumulating the enzyme in the medium, and recovering the enzyme from the medium. The enzyme is useful for medicine, agricultural chemicals and protection from bacterial infection on foods or animal feeds.

3,816,261

CULTURE MEDIUM FOR LERTOSPIRA ORGANISMS

Harry L. Torney, Indianapolis, Ind., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 725,519, April 30, 1968, abandoned. This application Apr. 1, 1971, Ser. No. 130,542

Int. Cl. C12k *1/06*

U.S. Cl. 195—96 **6 Claims**

A chemically defined, protein-free culture medium embodying an anion-exchange resin and a water-soluble lipid source provides means for producing high yields of Leptospira organisms.

3,816,262

REAGENT FORMULATIONS FOR ASSAYING BIOLOGICAL SPECIMENS AMD METHODS OF PREPARING AND USING SAME

Alexander A. Monte, and Ching Chiang, both of Glendora, Calif., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Continuation-in-part of Ser. No. 190,883, Oct. 20, 1971, abandoned. This application Nov. 19, 1971, Ser. No. 200,552

Int. Cl. G01n *31/14*

U.S. Cl. 195—100 **8 Claims**

A solid, water-soluble substantially anhydrous, storage-stable reagent formulation for use in conducting a clinical diagnostic test on a biological specimen is provided. The reagent formulation comprises a mixture containing a reagent capable of participating in a test reaction to effect a measurable change in a test system; and a nitrogen bearing polyoxyalkylene nonionic surfactant. The surfactant has a structure corresponding to that obtained when ethylene diamine is reacted sequentially with propylene oxide and ethylene oxide in the presence of a catalyst. The polyoxypropylene chains of said surfactant have an average molecular weight of between about 750 and about 6,750. Methods of preparing the reagent formulations and methods of using them to conduct clinical diagnostic tests are also provided.

3,816,263

BIOLOGICAL TEST

Brian Robert Rabin, and David John Williams, both of Biochemistry Department, University College, Gower, London W.C.1., England

Filed Mar. 6, 1972, Ser. No. 232,013

Claims priority, application Great Britain, Mar. 16, 1971, 6963/71

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 **7 Claims**

A method of testing a substance for carcinogenic activity which comprises contacting the substance with isolated cell membranes having masked rearrangase activity and after a predetermined interval of time testing the cell membranes for rearrangase activity. This method enables substances to be screened for possible carcinogenic activity. A test kit is also described.

3,816,264

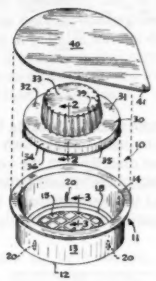
DISPOSABLE CULTURE DEVICE

William Robert Winter, Columbus, and Clark Searle Wadley, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 6, 1972, Ser. No. 303,886

Int. Cl. C12k *1/10*

U.S. Cl. 195—139 **6 Claims**



A disposable culture device for determining the presence of bacteria, particularly in a sample of urine, the device comprising a container having a receptacle therein for solid culture medium, the suspected sample being poured into the container to inoculate the medium, the excess sample being discarded. The container thereby comprises an independent enclosure for incubation and bacterial colony growth.

3,816,265

DISTILLATION OF READILY POLYMERIZABLE ETHYLENICALLY UNSATURATED AROMATIC HYDROCARBON COMPOUNDS WITH N-NITROSODIPHENYLAMINE

Calvin L. Daniels, and Robert Boadle, both of Big Spring, Tex., assignors to Cosden Oil & Chemical Company, Big Springs, Tex.

Filed Oct. 13, 1971, Ser. No. 189,046

Int. Cl. B01d *3/34*; **C07c** *7/04, 7/18*

U.S. Cl. 203—9 **7 Claims**

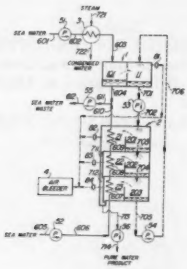
The present invention relates to a process for the distillation of readily polymerizable ethylenically unsaturated compounds comprising subjecting such compounds to distillation conditions in the presence of N-nitroso diphenyl amine as a polymerization inhibitor in the absence of oxygen (air) and sulfur.

3,816,266

PROCESS AND APPARATUS FOR MAKING HIGHLY PURE WATER

Kenkichi Izumi, and Zensuke Tamura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1973, Ser. No. 332,560
Claims priority, application Japan, Feb. 25, 1972, 47-18929
Int. Cl. B01d *3/02, 3/00, 3/10*
U.S. Cl. 203—11 6 Claims



A process and an apparatus for making highly pure water, in which fresh water obtained by the flash evaporation of hot sea-water is contacted directly with the vapour resulting from the flash evaporation, whereby said vapour is condensed to form fresh water, and the resultant fresh water is further subjected to flash evaporation to obtain highly pure water.

3,816,267

INHIBITION OF ACRYLATE POLYMERIZATION

Vincent T. Chuang, Marietta, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 20, 1971, Ser. No. 173,653
Int. Cl. C07c *69/54*
U.S. Cl. 203—8 5 Claims

This invention is concerned with inhibiting acrylates or methacrylates against polymerization during their distillation by providing predetermined and controlled quantities of a mixture of a quinone and an enol derivative of a quinone in the acrylates or methacrylates while they are undergoing distillation.

3,816,268

STABILIZED DISTILLATION OF PENTACHLOROPHENOL

William David Watson, and Erwin H. Kobel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 20, 1973, Ser. No. 353,195
Int. Cl. C07c *39/24*
U.S. Cl. 203—38 5 Claims

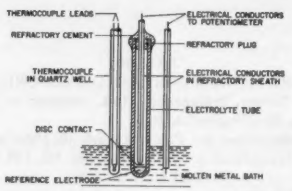
Purified pentachlorophenol is recovered in good yield by distilling the commercially available grade in the presence of a high boiling amine or alkanolamine under reduced pressure and preferably after the starting pentachlorophenol has been exposed to moisture. The purified product is nearly colorless and nonblooming and it is essentially free of polychlorinated dibenzo-p-dioxins and phenoxy-phenols.

3,816,269

METHOD FOR DETERMINING THE CONCENTRATION OF A METAL IN AN ALLOY MELT

Thomas C. Wilder, Cambridge, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 31,425, April 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 704,863, Feb. 12, 1968, abandoned. This application Mar. 28, 1972, Ser. No. 238,937
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T 5 Claims



The method for the direct quantitative measurement of a metal in a molten metal mixture or alloy using a galvanic cell is described.

3,816,270

METHOD OF PRODUCING THICK SCHOTTKY-BARRIER CONTACTS

Hermann Kniepkamp, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 9, 1971, Ser. No. 206,280
Claims priority, application Germany, Dec. 11, 1970, 2061202
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 8 Claims

Method of producing precise relatively thick metal-semiconductor contacts (Schottky-Barrier contacts) comprising, applying a layer of a photosensitive resist material onto a semiconductor surface having discrete metal areas thereon, subjecting the resist layer to controlled amounts of light so that the areas of the resist overlying metal areas are rendered soluble while other areas thereof remain insoluble, removing the soluble areas of the resist layer, applying a protective layer, as of metal, onto the exposed metal areas, and then removing the insoluble areas of the resist layer.

3,816,271

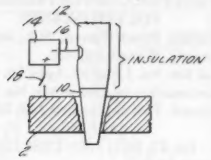
METHOD AND FORMULATIONS FOR PRODUCING DIFFUSE INFRARED REFLECTION COATING

Melvin Greenberg, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1968, Ser. No. 772,063
Int. Cl. C23b *5/06*
U.S. Cl. 204—51 3 Claims

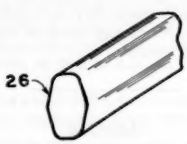
An electroplated chromium finish and a method for applying chromium which produces a stable diffuse grey surface having high infrared reflectance.

3,816,272
ECM TREATMENT OF SMALL HOLES
Frederick R. Joslin, Rt. 207, Lebanon, Conn. 06249
Filed Aug. 4, 1972, Ser. No. 278,136
Int. Cl. B23p *1/20*
U.S. Cl. 204—129.1 2 Claims



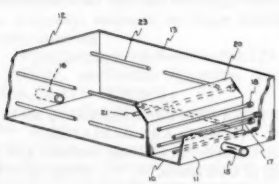
The recast surface layer on a laser-drilled hole is removed by an ECM technique that involves positioning an electrode in the hole and flowing an electrolyte through the hole and around the electrode in a direction toward the large end of the taper.

3,816,273
METHOD OF CHEMICALLY FORMING WIRE
H. Ben Snyder, Upland, Calif., assignor to General Dynamics Corporation (Pomona Division), Pomona, Calif.
Filed Dec. 22, 1972, Ser. No. 317,563
Int. Cl. C23b *3/06, 1/00*
U.S. Cl. 204—129.9 18 Claims



Disclosed is a method for chemically forming wire.

3,816,274
REMOVAL OF DISSOLVED OR SUSPENDED SOLIDS IN WASTE WATER
Harry T. Anderson, Clarendon Hills, Ill., assignor to Swift & Company, Chicago, Ill.
Filed Oct. 20, 1971, Ser. No. 191,008
Int. Cl. C02b *1/82*; C02c *5/12*; B01k *3/00*
U.S. Cl. 204—149 7 Claims



Waste water containing oil and water emulsions and dissolved or suspended solids is de-emulsified and clarified by creating a three dimensional anolyte stream resulting from the careful placement of anodes and impressing direct or galvanic current through the water. Waste water is first contacted with an anode system in a restricted zone so as to give substantially all of the waste water a rapid pH change of several units and is then conveyed to a second zone wherein a three dimensional anolyte stream is formed causing the oily particles to float to the surface of the water where they can be skimmed off.

3,816,275
PROCESS FOR TREATMENT OF WASTE LIQUORS CONTAINING DIFFICULTY DECOMPOSABLE CYANO-COMPLEX
Minoru Ichiki, and Masahito Ishii, both of Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed Feb. 8, 1973, Ser. No. 330,473
Claims priority, application Japan, Feb. 15, 1972, 47-16206
Int. Cl. C02c *5/12*
U.S. Cl. 204—149 4 Claims

A process for treating a waste liquor containing a difficultly decomposable cyano-complex such as ferrocyanides and ferricyanides and/or cyano ions, which comprises electrolyzing said waste liquor by employing iron as an anode to thereby form water-insoluble colloid, floating and concentrating said colloid by an action of bubbles formed during the electrolysis to thereby convert it to a scum, and removing the scum from said waste liquor in an electrolytic cell to thereby obtain a purified liquor free of cyano-component.

3,816,276
METHOD FOR THE TREATMENT OF WATER
Minoru Ichiki, and Kazuhiko Nakade, both of Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed Mar. 16, 1973, Ser. No. 342,210
Claims priority, application Japan, Mar. 22, 1972, 47-28674
Int. Cl. B01k *1/82*; C02c *5/12*
U.S. Cl. 204—152 4 Claims

Method for treating such water which contains metal ions, oils or suspended solids through a series of processes: the first process in which water containing metal ions, oils or suspended solids is electrolyzed in the first electrolytic cell provided with an anode made of aluminum or aluminum alloy while blowing air into said water, so that said metal ions, oils or suspended solids are changed to compounds insoluble in water; then, the second process in which anionic water-soluble high molecular materials are added to the water obtained from said first process, so that said compounds are converted into coagulums which by their structures are apt to ascend to and float on the water surface; and finally the third process in which the water obtained from the second process is electrolyzed in the second electrolytic cell provided with an insoluble anode, so that all said coagulums are substantially caused to ascend to and float on the water surface so as to be separated from the water, thus obtaining harmless and clean water.

3,816,277
PREPARATION OF FLUOROALKANE SULPHIDES
Robert Neville Haszeldine, Windyridge Lyme Rd., Disley, and Anthony Edgar Tipping, 19 Canberra Rd., Bramhall, both of England
Filed July 18, 1972, Ser. No. 272,829
Claims priority, application Great Britain, Aug. 6, 1971, 37118/71
Int. Cl. B01j *1/10*; C07c *149/14*
U.S. Cl. 204—158 R 15 Claims

A fluorinated iodoalkane is reacted with a dialkyl sulfide or dialkyl disulfide to prepare a fluoroalkyl sulfide. An optional, additional reactant is an alkali metal alkane thiolate. The

fluoroalkyl sulfides are readily converted to fluoroalkyl sulfonic acids which are useful as surfactants and corrosion inhibitors.

3,816,278

PHOTOPOLYMERIZABLE EPOXY SYSTEMS CONTAINING NITRILE GELATION INHIBITORS

William R. Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 144,667, May 18, 1971, Pat. No. 3,721,616. This application Dec. 13, 1972, Ser. No. 314,613The portion of the term of this patent subsequent to Mar. 20, 1990, has been disclaimed.

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.11 **32 Claims**

Polymerization of epoxides and mixtures of epoxides with lactones and vinyl compounds, polymerizable through the action of cationic catalysts, is controlled in compositions essentially free of volatile solvents by providing in such compositions, in association with a radiation-sensitive catalyst precursor, a gelation inhibitor in the form of a nitrile compound such as acetonitrile present in small amounts up to several percent by weight.

3,816,279

PHOTOPOLYMERIZATION OF MIXTURES OF EPOXIDE MATERIALS AND TETRAHYDROFURAN

Sheldon I. Schlesinger, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 753,869, Aug. 20, 1968, Pat. No. 3,708,296. This application Oct. 19, 1972, Ser. No. 298,937

Int. Cl. B01j *1/10;* **C08d** *1/00*

U.S. Cl. 204—159.11 **12 Claims**

Polymerization of polymerizable compositions comprising mixtures of monomeric or prepolymeric epoxides and tetrahydrofuran is effected by mixing such compositions with radiation-sensitive aromatic diazonium salts which decompose upon application of energy such as electromagnetic radiation to release a Lewis acid to initiate polymerization of said monomers.

3,816,280

PHOTOPOLYMERIZABLE EPOXY SYSTEMS CONTAINING CYCLIC AMIDE GELATION INHIBITORS

William Russell Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 144,642, May 18, 1971, Pat. No. 3,721,617. This application Dec. 13, 1972, Ser. No. 314,614

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.11 **32 Claims**

Polymerization of epoxides and mixtures of epoxides with lactones and vinyl compounds, polymerizable through the action of cationic catalysts, is controlled by providing, in association with a radiation-sensitive catalyst precursor, a gelation inhibitor in the form of a cyclic amide, such as an N-substituted 2-pyridone, or a 2-pyrrolidinone monomer or polymer substituted in the 1-position.

3,816,281

POLY (VINYL PYRROLIDONE) STABILIZED POLYMERIZED EPOXY COMPOSITIONS AND PROCESS FOR IRRADIATING SAME

Jacob Howard Feinberg, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 30, 1973, Ser. No. 355,884

Int. Cl. B01j *1/10;* **C08d** *1/00*

U.S. Cl. 204—159.11 **31 Claims**

Polymerization of epoxides and mixtures of epoxides with lactones and vinyl compounds polymerizable through the action of cationic catalysts, is controlled by providing, in association with a radiation-sensitive catalyst precursor, a gelation inhibitor in the form of a substituted poly(vinyl pyrrolidone) wherein the carbon atom adjacent to the carbonyl group contains an alkyl or aryl substituent.

3,816,282

RADIATION INDUCED POLYMERIZATION OF POLYSILOXANES

Richard V. Viventi, Beach Haven, N.J., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 134,510, April 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 788,951, Jan. 3, 1969, abandoned. This application Jan. 26, 1973, Ser. No. 327,167

Int. Cl. B01j *1/10;* **C08f** *35/02*

U.S. Cl. 204—159.13 **2 Claims**

A room temperature vulcanizable silicone rubber composition comprising a polydiorganosiloxane, a mercaptopolysiloxane and a free radical source which composition cures in the presence of radiation.

3,816,283

RADIATION POLYMERIZABLE VINYL ESTER RESINS CONTAINING 2-OXAZOLINE AND GUANIDINE ADDITIVES

Inder Mani, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 13, 1971, Ser. No. 142,853

Int. Cl. C08d *1/00;* **C08f** *1/00*

U.S. Cl. 204—159.15 **16 Claims**

The addition of at least about 0.3 weight percent of a 2-oxazoline, a guanidine or certain amines to a thermosettable mixture of certain vinyl monomers and a polymerizable vinyl ester resin reduces the dosage level of ionizing radiation required to cure the mixture.

3,816,284

RADIATION GRAFTING OF VINYL MONOMERS ONTO CELLULAR POLYMERIC SUBSTRATES

Tsutomu Kagiya, Kyoto; Hiroshi Mitsui, Takasaki; Fumio Hosoi, Takasaki; Takahiko Fujimoto, Takasaki; Hiroshi Takata, Takasaki; Kazuyoshi Tsuneta, Takasaki, and Masahiro Ushirokawa, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Aug. 20, 1971, Ser. No. 173,695

Claims priority, application Japan, Aug. 22, 1970, 45-73592

Int. Cl. B01j *1/10, 1/12;* **C08f** *15/00*

U.S. Cl. 204—159.17 **1 Claim**

The heat resistance of cellular plastics is remarkably improved when they are subjected to irradiation by ionizing radiation in the presence of a mixture of a cross-linking agent comprising an acetylenic compound having an ethynyl radical and/or an allene compound having a 1,2 diene structure, and a vinyl monomer.

3,816,285

PHOTONITROSATION PROCESS USING SWIRL-FLOW PLASMA ARC RADIATION

Clairborn Lee Osborn; Michael Ray Sandner, and David John Trecker, all of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

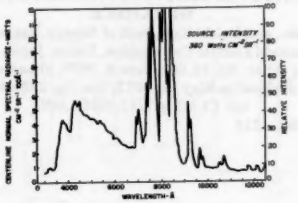
Filed Nov. 30, 1971, Ser. No. 203,362

Int. Cl. B01j *1/10*

U.S. Cl. 204—162 XN **6 Claims**

Non-ionizing high intensity predominantly continuum light radiation having a source intensity of at least about 350 watts

per square centimeter steradian when integrated throughout the entire spectral range of said continuum light radiation is used as the energy source in photochemical reactions. A convenient source of this non-ionizing high intensity predominantly continuum light radiation is a swirl-flow plasma arc radiation apparatus. Among the photochemical reactions that



can be carried out, at unexpectedly faster rates and at higher conversions, are photoreduction reactions, photocycloaddition reactions, oxetane formation reactions, halogen additions, halogen substitutions, photonitrosation reactions, photosulfoxidation reactions, bisulfite addition reactions, and many other photochemical addition and substitution reactions.

3,816,286

PROCESS FOR INSERTION OF HEXAFLUOROPROPENE AT THE ALIPHATIC CARBON-HYDROGEN BOND OF A HYDROCARBON OR SUBSTITUTED HYDROCARBON

Robert Neville Haszeldine, Windyridge Lyme Rd., Disley, and Ronald Rowland, 61 Bruche Ave. N., Padgate, both of England

Filed Jan. 5, 1973, Ser. No. 321,415

Claims priority, application Great Britain, Jan. 24, 1972, 3328/72

Int. Cl. B01j *1/10*

U.S. Cl. 204—163 R **3 Claims**

Process for the addition of hexafluoropropene in the presence of ultra violet light to a hydrocarbon or substituted hydrocarbon compound containing at least one aliphatic carbon-hydrogen bond and which is free of acetylenic and terminal ethylenic unsaturation.

3,816,287

PHOTOLYTIC PROCESS FOR THE CONTINUOUS PRODUCTION OF BENZOTRICHLORIDE WITH A LOW BENZAL CHLORIDE CONTENT

Walter Bockmann, and Rudolf Hornung, both of Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

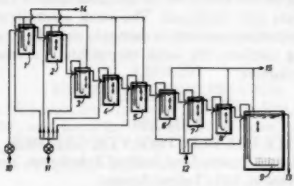
Filed Oct. 2, 1972, Ser. No. 294,129

Claims priority, application Germany, June 6, 1972, 2227337; Oct. 22, 1971, 2152608

Int. Cl. B01j *1/10*

U.S. Cl. 204—163 R **7 Claims**

Benzotrichloride is prepared in a continuous process in two steps. In the first step toluene is reacted with chlorine in the presence of light, at a temperature in the range of 70° to 190°C and in at least two vessels or reactors. In the second step benzal chloride and residual benzyl chloride produced in the first step are converted to benzotrichloride by reaction with an excess of chlorine at a temperature of from 70° to 190°C. The chlorine in the second step is diluted with an inert gas and like the first step the second step is carried out in at least two vessels and the residence time for the reaction for the first and



second steps in the ratio of 1.3 to 1.5. The ratio of chlorine to inert gas is regulated from vessel to vessel in the second step of the reaction.

3,816,288

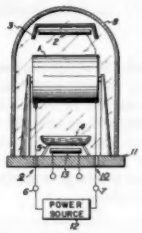
GLOW DISCHARGE TECHNIQUE FOR THE PREPARATION OF ELECTROPHOTOGRAPHIC PLATES

George S. Lubicz, Rochester, and Alan J. Bills, Ontario, both of N.Y., assignors to Zerox Corporation, Stamford, Conn.

Division of Ser. No. 39,945, May 20, 1970, abandoned. This application Oct. 21, 1971, Ser. No. 191,337

Int. Cl. C23b *11/02*

U.S. Cl. 204—164 **4 Claims**



A method of preparing an electrophotographic plate having a metallic oxide coating interface is disclosed. The preparation of the plate involves subjecting a metallic substrate to a glow discharge process by utilizing it as the anode electrode in the electrical discharge process. The glow discharge effects oxidation of the surface as well as heating the substrate to a temperature at which vacuum evaporation of the photoconductive layer takes place. The process has particular utility because the glow discharge — oxidation process effectively cleans the metallic substrate thereby preparing it for the subsequent evaporation of a pure photoconductive material such as selenium.

3,816,289

METHOD OF REPAIR ELECTROCOATING A METAL SUBSTRATE

Le Roy Landauer, Crystal Lake, and Ronald Joseph Zukowski, Buffalo Grove, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 17, 1971, Ser. No. 209,305

Int. Cl. B01k *5/02*; **C23b** *13/00*

U.S. Cl. 204—181 **13 Claims**

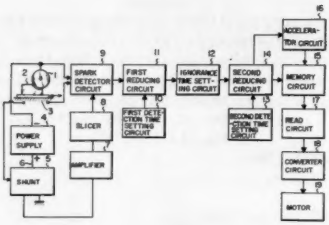
An improved method of electrodepositing a repair coat of material upon discontinuities such as scratches in the base coat of a metal substrate, which comprises including as a step in the conventional method, the step of contacting the electrocoating medium utilized with a weak electrolyte having a

dissociation constant no greater than 1×10^{-4} at 25°C in an amount and at a rate such that more of the coating material from the medium repair coats and more effectively seals the discontinuities in the base coat in less time than if the weak electrolyte were not employed. The weak electrolyte in an anodic electrocoating medium is carbonic acid. In a cathodic electrocoating medium, the weak electrolyte is a weak base such as triethylamine.

3,816,290
DEVICE FOR ELECTROLYTIC GRINDER

Yasuo Suzuki, and Tsuneo Oku, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1972, Ser. No. 316,513
Claims priority, application Japan, Dec. 20, 1971, 46-103376
Int. Cl. B23p *1/04, 1/12*
U.S. Cl. 204—218 **2 Claims**

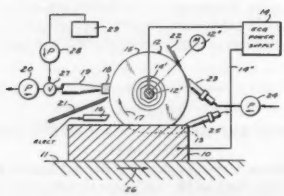


An electrolytic grinder in which the feed rate of the worktable is controlled so as to best meet the machining requirements, thereby obviating the problems of a lower machining efficiency and accuracy as well as reduced smoothness of the surface of a workpiece and the short-circuiting between the grinding electrode or wheel and the work piece that might result from the fact that a voltage is applied between the grinding wheel and the work piece.

3,816,291
APPARATUS FOR INCREASING THE ACCURACY OF ELECTROCHEMICAL GRINDING PROCESS

Kiyoshi Inoue, 100 Sakato, Kamaaki, Kanagawa, Japan

Division of Ser. No. 830,263, June 4, 1969, Pat. No. 3,533,925, which is a division of Ser. No. 599,051, Dec. 5, 1966, Pat. No. 3,476,662. This application Feb. 16, 1970, Ser. No. 14,841
Int. Cl. B23p *1/04*
U.S. Cl. 204—224 M **11 Claims**

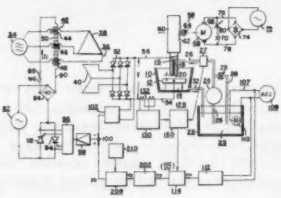


Improved electrochemical-grinding apparatus and method whereby the accuracy of reproduction of the electrode contour in the workpiece is sharply increased by limiting the thickness of the electrolyte film carried by the grinding wheel to a minimum. The film thickness is reduced by a scraper or wiper held against the wheel, by directing a stream of high-velocity air thereagainst to dissolve the excess electrolyte, and/or by electrochemically reforming the electrolyte. The wiper may serve as an electrode for the re-formation of the electrolyte film or as the nozzle for the jet of air and is contoured complementarily to the wheel by electrochemical action or casting thereagainst. Both the wheel and the electrode are preferably composed of graphitic materials.

3,816,292
APPARATUS FOR ELECTROLYTICALLY ETCHING A WORKPIECE

Nagao Saito, and Yoichi Kuji, both of Nagoya, Japan, assignors to Mitsubishi Electric Corporation, Tokyo, Japan

Division of Ser. No. 44,502, June 8, 1970, abandoned. This application May 31, 1972, Ser. No. 258,465
Int. Cl. B23p *1/12*; B01k *3/00*
U.S. Cl. 204—225 **18 Claims**

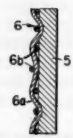


A method and apparatus for electrolytically etching a workpiece by controlling the working voltage by means of a factor proportional to the ratio of the amount of electrolyte to that of gas within the working gap. The working voltage is so controlled to properly change the specific resistance of the electrolyte and thereby accurately maintain the distance of the working gap at a constant and predetermined value.

3,816,293
ELECTRODE CONSTRUCTION AND METHOD OF MAKING AN ELECTRODE

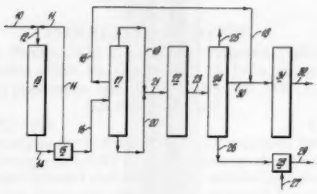
Kenji Ueda, and Akihiro Tanaka, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1972, Ser. No. 239,160
Int. Cl. B01k *3/04, 3/06*; C23f *13/00*
U.S. Cl. 204—290 R **11 Claims**



An electrode comprises a lead base which is covered by a silver material on at least a portion of the surface which is in the form of a net or grid. The lead base itself, may include some percentage of silver and the net or grid may be in the form of a bandage or of a netting which is applied over the surface and then secured to the surface. The securement may be effected such as by mechanical pressure joining with or without additional securement elements or by heat joining such as by welding.

3,816,294
PRODUCTION OF ALKYLATE
Raymond F. Wilson, Fishkill; John H. Estes, Wappingers Falls, and Stanley Kravitz, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 29, 1972, Ser. No. 319,573
Int. Cl. C07c *3/52*; **C10g** *13/02*
U.S. Cl. 208—61 **15 Claims**

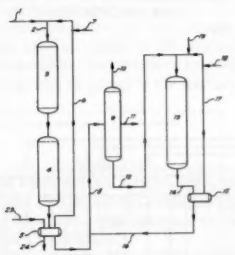


Increased yields of gasoline may be obtained by isomerizing-cracking a low octane paraffin stream and then alkylating the isobutane fraction therein with an olefin fraction recovered by thermally steam cracking the deisobutanized isomerized-cracked stream.

3,816,295
PRODUCTION OF LUBRICATING OILS
Richard L. Coleman, Port Arthur; Billy H. Cummins, Nederland, and John P. Shillinglaw, Jr., Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 14, 1972, Ser. No. 315,274
Int. Cl. C10g *13/00*
U.S. Cl. 208—86 **10 Claims**

Improved lubricating oils are prepared by simultaneously solvent refining-deasphalting a vacuum residuum, hydrocracking the product and fractionating the hydrocracked oil to remove material having a viscosity SUS at 210° F of at least 300.

3,816,296
HYDROCRACKING PROCESS
Robert H. Hass; Cloyd P. Reeg, both of Fullerton, and Edward C. Attane, Jr., Orange, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.
Filed Nov. 13, 1972, Ser. No. 305,783
Int. Cl. C10g *37/02*
U.S. Cl. 208—111 **8 Claims**



Midbarrel fuels boiling primarily between about 300° and about 700°F are selectively produced from higher boiling feeds containing less than 10 ppm nitrogen by hydrocracking in the presence of controlled amounts of added nitrogen compounds including ammonia or hydrocarbon amines in amounts corresponding to about 5 to about 100 ppm nitrogen. Furthermore, the relative distribution of midbarrel and lower boiling products can be controlled by controlling the amount of nitrogen compounds added to the hydrocracking zone.

3,816,297
HYDROCRACKING PROCESS
Thomas M. Liden, c/o Texaco Inc., P.O. Box 509, Beacon, N.Y. 125208, and John E. May, Jr., c/o Texaco Inc., P.O. Box 1608, Nederland, Tex. 77627
Filed June 25, 1968, Ser. No. 739,646
Int. Cl. C10g *13/02*
U.S. Cl. 208—111 **4 Claims**

A hydrocracking process for the conversion of heavy hydrocarbon oils using a catalyst containing a hydrogenating component and a cracking component which latter is composed of a modified crystalline zeolite and at least one amorphous inorganic oxide. The process is particularly adapted to hydrocrack charge stocks which are traditionally difficult to hydrocrack such as those having a high nitrogen content, a high polycyclic aromatic content or a Conradson Carbon Residue of at least 1 percent.

3,816,298
HYDROCARBON CONVERSION PROCESS
Clyde L. Aldridge, Baton Rouge, La., assignor to Esso Research and Engineering Company, Linden, N.J.
Continuation-in-part of Ser. No. 125,581, March 18, 1971, abandoned. This application Dec. 20, 1972, Ser. No. 316,836
Int. Cl. C10g *9/28*
U.S. Cl. 208—112 **19 Claims**

A process wherein a hydrocarbon feedstream comprising heavy hydrocarbons is simultaneously coked, partially desulfurized, hydrogenated, cracked and partially converted to a hydrogen-containing gas in the presence of an alkali metal containing catalyst.

3,816,299
HYDROGENATION PROCESS
David E. Mears, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Apr. 30, 1973, Ser. No. 355,576
Int. Cl. C10g *23/04*
U.S. Cl. 208—143 **9 Claims**

Aromatic hydrocarbons, particularly monocyclic hydrocarbons, are hydrogenated without substantial hydrocracking in the presence of a Group VIII metal hydrogenating component supported on a porous support such as alumina, while adding continuously or intermittently to the reaction zone a small proportion of carbon tetrachloride as a catalyst activator.

3,816,300
PLATINUM-RHENIUM HYDROCARBON CONVERSION PROCESS
James P. Gallagher, and Leonard D. Krenzke, both of 400 E. Sibley Blvd., Harvey, Ill. 60426
Filed Aug. 6, 1971, Ser. No. 169,826
Int. Cl. C10g *35/06*
U.S. Cl. 208—139 **18 Claims**

Increased product yields are obtained using an alumina-platinum group metal-rhenium-halogen catalyst wherein the alumina is derived from hydrous alumina predominating in alumina trihydrate by employing a water concentration in contact with the catalyst during processing regulated within a range higher than substantially anhydrous conditions. Additional beneficial results are obtained, if, prior to processing, the catalyst is contacted with a hydrogen-containing gas containing at least about 5 mole ppm. of water vapor.

3,816,301
PROCESS FOR THE DESULFURIZATION OF HYDROCARBONS

Harold A. Sorgenti, Olympia Fields, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed June 30, 1972, Ser. No. 268,160
Int. Cl. C10q *17/00, 31/14*
U.S. Cl. 208—208 R **22 Claims**

A process for reducing the sulfur content of sulfur-containing hydrocarbon material by oxidizing at least a portion of the sulfur in the sulfur-containing hydrocarbon material with an oxidant in the presence of certain catalysts, for example, a molybdenum-containing catalyst. The oxidized sulfur-containing hydrocarbon material is further processed by means of a sulfur reducing step to remove sulfur from the hydrocarbon material. A hydrocarbon material having reduced sulfur content is thereafter recovered. The preferred oxidant is tertiary butyl hydroperoxide and the oxidation may occur in the presence of a solvent, preferably tertiary butyl alcohol. The tertiary butyl alcohol, which is removed from the oxidized sulfur-containing hydrocarbon material, can be dehydrated to isobutylene and further dimerized to form diisobutylene.

3,816,302
PROCESS FOR THE RECOVERY OF AROMATIC HYDROCARBONS FROM MIXTURES CONTAINING THE SAME

Giancarlo Paret, Milan, Italy, assignor to Snam Progetti, S.p.A., San Donato Milanese, Italy

Filed Dec. 29, 1971, Ser. No. 213,567
Claims priority, application Italy, Dec. 29, 1970, 33615/70
Int. Cl. C10g *21/06*
U.S. Cl. 208—323 **7 Claims**

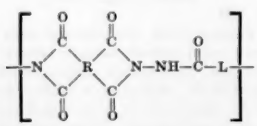
A process is disclosed whereby aromatic hydrocarbons such as benzene, toluene and xylene are separated with high selectivity from mixtures in which they are contained through extraction and/or extractive distillation with the aid of a solvent mixture including morpholine and another solvent such as an oxygen containing derivative of morpholine and water, e.g. morpholine-water, morpholine-N-formyl morpholine and morpholine-N-formyl morpholine-water, in three main steps: (1) concentration of non-aromatic hydrocarbons to produce a stream free from aromatics; (2) purification of aromatics dissolved in rich solvent; and (3) recovery of the aromatics from the rich solvent.

3,816,303
POLY (N-AMIDO) IMIDES AS SEMIPERMEABLE MEMBRANES

Wolfgang J. Wrasidlo, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 20, 1972, Ser. No. 316,935
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **8 Claims**

Semipermeable membranes are prepared from poly(N-amido)imides, i.e., polymers characterized by the recurring structural group

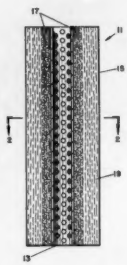


where R is a tetravalent organic radical and L is a divalent organic radical.

3,816,304
FILTERING METHOD

Craig Wallis, and Joseph L. Melnick, both of Houston, Tex., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 27, 1971, Ser. No. 192,890
Int. Cl. B01d *15/00, 39/06*
U.S. Cl. 210—36 **8 Claims**



An annular filter element includes a contiguous layer of gel impregnated filter media substantially concentric with a center passage. To remove viruses from a liquid, the liquid is passed through the layer of gel which is formed by the method of contacting the filter media with an aqueous solution containing colloidal particles of a polyvalent metal.

3,816,305
CLARIFICATION OF TAR SANDS MIDDLINGS WATER

Robert Schutte, Sherwood Park, Alberta, Canada, assignor to Gulf Oil Canada Limited; Canada-Cities Service, Ltd.; Imperial Oil, Limited and Atlantic Richfield Canada Ltd., a part interest to each

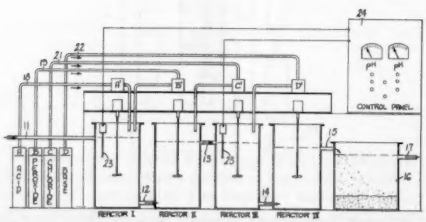
Filed Dec. 23, 1971, Ser. No. 211,762
Int. Cl. B01d *21/01;* **C02b** *1/20*
U.S. Cl. 210—42 **1 Claim**

A process for treating tar sands to cause flocculation or coagulation of the clays and other small solids particles present in middlings and tailings streams produced from the hot water process is disclosed. The process involves the addition of an acid to the water to accelerate clarification of the water and reduce required sludge settling pond area.

3,816,306
COPPER ETCHANT EFFLUENT TREATMENT

Clarence H. Roy, Oak Ridge Dr., Bethany, Conn. 06513

Continuation-in-part of Ser. No. 254,933, May 19, 1972, abandoned. This application Apr. 13, 1973, Ser. No. 350,834
Int. Cl. C02c *5/04*
U.S. Cl. 210—49 **13 Claims**



The copper content of aqueous effluent containing the rinsings from the etching of copper containing substrates is

reduced to less than about 5 ppm., by the steps of: (a) adjusting the pH of the effluent to no more than about 4.; (b) providing in the effluent, while vigorously agitating, hydrogen peroxide and a water soluble compound such as calcium chloride; and (c) adding to the reaction mixture as required an alkaline material such as lime or a water soluble salt of carbonic acid, in an amount effective to adjust the pH to at least about 8.

3,816,307

FIRE RETARDANT RESINS

William G. Woods, 1011 N. Lemon St., Fullerton, Calif. 92631

Continuation of Ser. No. 54,636, July 13, 1970, abandoned. This application Apr. 28, 1972, Ser. No. 248,771

Int. Cl. C09k *3/28*

U.S. Cl. 252—8.1 **8 Claims**

A composition for rendering resin compositions fire retardant consisting essentially of a dry mixture of particles of a finely divided Group I metal borate or ammonium borate, said borate having an average particle size of from 0.1 to about 25 microns, and antimony oxide, the weight ratio of said borate to antimony oxide being no greater than 4:1.

3,816,308

BENEFICIATING AGENTS

John R. Le Blanc, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 5, 1972, Ser. No. 250,619

Int. Cl. C10m *3/22*

U.S. Cl. 252—8.5 A **15 Claims**

The present invention relates to compositions of matter which are especially useful as beneficiating agents in the production of well drilling muds. These compositions comprise mixtures of carboxylic acid polymers and metal salts which mixtures are water soluble at a pH of less than 7.0 wherein the metal is selected from groups IB, IIB, VIB, VIIB and VIII of the Periodic Table and lead.

3,816,309

FRICTION MATERIAL

Francois Courcier, Mun Saint-Maur; Jean Blouet; Robert Courtel, both of Paris; Rene Gras, Eaubonne, all of France, and Francis Risler, Universite de Shubrooke Quebec, Canada, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 829,248, June 2, 1969, abandoned. This application July 13, 1971, Ser. No. 162,215

Int. Cl. C10m *7/02*

U.S. Cl. 252—12 **1 Claim**

The friction material consists of a mixture of chromic oxide and 5 to 25 of zirconium oxide. At least a third oxide such as neodymium oxide may be added to the mixture and known lubricants such as graphite, molybdenum bisulfide, calcium or barium fluoride may also be added to the mixture.

3,816,310

METHOD FOR PREPARING HIGHLY BASIC GREASE AND RUST INHIBITING COMPOSITIONS

Mack W. Hunt, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 727,719, May 8, 1968, abandoned. This application Mar. 15, 1971, Ser. No. 124,592

Int. Cl. C10m *5/24, 5/22, 7/44*

U.S. Cl. 252—32.7 HC **47 Claims**

Method of preparing highly basic, metal containing grease and rust inhibiting compositions which is carried out by (1) forming an admixture of an oil-soluble dispersing agent, an alcohol, water, and an alkaline earth metal oxide, hydroxide or lower alkoxide; (2) carbonating the admixture to form the alkaline earth metal carbonate; and (3) heating the mixture in a controlled manner to effect a modification reaction in which the grease or rust inhibiting composition is formed as evidenced by a rapid change in the viscosity of the mixture. In an alternative embodiment of the method the water is added after the carbonation step and prior to the heating step.

3,816,311

STABLE PHOSPHATE ESTERS

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 19, 1971, Ser. No. 117,094

Int. Cl. C10m *1/30, 1/38*

U.S. Cl. 252—46.7 **8 Claims**

Esters of an acid of phosphorus such as tricresyl phosphate containing a stabilizing amount of a 2,5-bis-(4-pyridyl)-1,3,4-thiadiazole are useful as lubricants or functional fluids at elevated temperatures in contact with metal surfaces.

3,816,312

LUBRICATING COMPOSITIONS INHIBITED FROM OXIDATION

Enzo Rossi, and Silvano Fattori, both of San Donato Milanese, Italy, assignors to Snam Progetti, San Donato, Milanese, Italy

Filed Sept. 15, 1972, Ser. No. 289,227

Int. Cl. C10m *1/38*

U.S. Cl. 252—48.2 **6 Claims**

A lubricating composition of mineral oil or synthetic oil is inhibited from oxidation by dissolving therein, at temperatures not higher than 80° C, from 0.001 to 10 per cent by weight of a derivative of thio-thiophthene which is represented by the general formula:

wherein R, R_1, R_2 and R_3, which may be the same or different, are members of the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, alkoxyaryl, alkoxyalkyl, and aroxyalkyl, or R_2 and R_3 are combined and together represent an alkylene radical of the $-CH_2-$ type joined directly or by an equal CH_2-Ch_3 group to the other alkylene radical.

3,816,313

LUBRICANT PROVIDING IMPROVED FATIGUE LIFE

Hans J. Szieleit, Sarnia, Ontario, Canada, assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Nov. 17, 1972, Ser. No. 307,492

Int. Cl. C10m *1/50*

U.S. Cl. 252—49.6 **9 Claims**

The fatigue life of a lubricant composition, particularly one designed for the lubrication of bearings having rolling elements, is markedly improved by incorporating therein a condensation polymer of an alkyl trialkoxy silane or of an alkoxyalkyl trialkoxy silane.

3,816,314

BLOCK COPOLYMERS OF UNSATURATED ESTER AND A NITROGEN CONTAINING MONOMER AS V.I. IMPROVING AND DISPERSANT ADDITIVES FOR OILS

James J. Pappas, Parsippany, and Albert Rossi, Warren, both of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed May 31, 1972, Ser. No. 258,384

Int. Cl. C10m *1/32*

U.S. Cl. 252—51.5 A **13 Claims**

Block copolymers comprising an oil-soluble segment and a polar segment exhibit improved dispersancy characteristics in multifunctional viscosity index improver applications.

3,816,315
MINERAL OIL COMPOSITIONS
Abraham Morduchowitz, Monsey, and Isaac D. Rubin, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed June 19, 1972, Ser. No. 263,801
Int. Cl. C10m 1/32
U.S. Cl. 252—51.5 A 5 Claims

A mineral oil composition of improved viscosity, pour depressing and detergent-dispersant properties comprising as a major component a mineral oil of lubricating viscosity and a viscosity index improving amount of an interpolymer of dialkylaminoalkyl methacrylate, styrene or alkyl substituted styrene, C_{10}–C_{14} alkyl methacrylate and C_{16}–C_{20} alkyl methacrylate.

3,816,316
SOAP THICKENED HYDRAULIC OIL COMPOSITION
John Q. Griffith, III; Edward S. Williams, both of Claymont, Del., and William H. Reiland, Jr., West Chester, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Continuation-in-part of Ser. No. 34,899, May 5, 1970, Pat. No. 3,694,363. This application Sept. 7, 1971, Ser. No. 178,479The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.
Int. Cl. C09k 3/00
U.S. Cl. 252—72 18 Claims

An improved antileak hydraulic oil of the gel-thickened type comprises an effective amount of a lithium soap (e.g., 0.1–1% Li stearate) or an aluminum soap (e.g., 0.5–2% Al stearate), or mixtures of such soaps, and a base oil having a viscosity in the range of 70–3000 SUS at 100°F., said base oil comprising at least one hydro-refined naphthenic oil or a hydrocracked paraffinic oil having a viscosity in the range of 40–12,000 SUS at 100°F. The hydraulic oil can also contain an antirust agent (e.g., 0.02–2%) barium petroleum sulfonate, an antioxidant (e.g., an amine type) and an antiwear (e.g., 0.1–5% zinc dialkyl dithiophosphate).

3,816,317
GOLD ETCHANT
Donald Morley MacArthur, Berkeley Heights, and Peter Kenny Skurkiss, Bloomfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 1, 1972, Ser. No. 285,875
Int. Cl. C23f 1/02
U.S. Cl. 252—79.5 3 Claims

A technique for patterning of gold in the presence of palladium on integrated and thin film circuits involves the use of a novel selective etchant for gold comprising an alkaline solution of a ferricyanide salt and a cyanide salt.

3,816,318
DETERGENT
Gerhard Oskar Hentschel, Gothenburg, Sweden, assignor to Walter S. E. Hentschel, Gothenburg, Sweden, a part interest
Filed June 16, 1972, Ser. No. 263,442
Int. Cl. C11d 1/83
U.S. Cl. 252—89 10 Claims

Detergent compositions containing monoesters produced through esterifying dibasic or polybasic organic aliphatic carboxylic acids and/or dibasic or polybasic aromatic carboxylic acids with alcohols. These monoesters replace in the detergent previously used phosphates which caused eutrofication and endangered the ecology.

3,816,319
ACTIVATION OF PEROXIDE WASHING AND BLEACHING BATHS
Pierre Sarot, Vilvoorde; Michel Delattre, Rixensart, and Alain Decamps, Brussels, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium
Filed May 26, 1971, Ser. No. 146,932
Claims priority, application France, May 27, 1970, 70.19481
Int. Cl. C11d 7/54
U.S. Cl. 252—95 8 Claims

The acylation products of dioximes are used as activators for washing and bleaching baths containing a peroxide compound.

3,816,320
STABLE DISHWASHING COMPOSITIONS CONTAINING SODIUM DICHLOROISOCYANURATE DIHYDRATE
Duncan S. Corliss, Roselle, N.J., assignor to FMC Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 309,277, Nov. 24, 1972, abandoned. This application May 14, 1973, Ser. No. 359,915
Int. Cl. C11d 7/56
U.S. Cl. 252—99 5 Claims

A dishwashing composition having high stability against loss of available chlorine is formulated to contain 0.5 to 10 percent by weight of sodium dichloroisocyanurate dihydrate, 5 to 65 percent of an alkali metal silicate, 20 to 60 percent of a compound having water softening and detergent building properties, usually sodium tripolyphosphate, 0.5 to 10 percent of a low-foaming chlorine-compatible nonionic surface active agent, and 0 to 50 percent of filler, usually sodium carbonate.

3,816,321
LAUNDERING AID
David Charles Kleinschmidt, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 3, 1972, Ser. No. 249,810
Int. Cl. C02b 1/60, 1/72; C11d 17/04
U.S. Cl. 252—134 9 Claims

A laundering aid comprising a water-insoluble, polyurethane-polyalkyleneimine material releasably combined with a detergent composition, said aid providing a means of introducing a detergent composition into a laundry bath and at the same time serving to adsorb dirt and vagrant anionic dyes from the aqueous laundry media, thereby providing an improved laundering process.

3,816,322
CORROSION INHIBITOR
Thomas J. Griffin, and Francis E. Dollarhide, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.
Filed Oct. 2, 1972, Ser. No. 294,327
Int. Cl. C11d 7/32
U.S. Cl. 252—147 6 Claims

Iron surfaces are protected against corrosion by aqueous acidic solutions containing a polyhydric compound or deriva-

tive thereof by dispersing into the corrosive solution which will contact the metal surface an effective amount of a heterocyclic amine, an acetylenic alcohol and an ionizable iodine containing compound.

3,816,323

PROCESS FOR THE VULCANIZATION OF NATURAL OR SYNTHETIC RUBBER

Theo Kempermann, Cologne-Lindenthal, and Ulrich Eholzer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, both of, Germany

Filed Feb. 23, 1972, Ser. No. 228,726

Claims priority, application Germany, Feb. 26, 1971, 2109244

Int. Cl. C08c *11/54, 11/56*

U.S. Cl. 252—182 **7 Claims**

This invention relates to a process for the vulcanization of rubbers produced from halogen-free dienes in the presence of sulphur and/or sulphur donors and a combination of vulcanization accelerators consisting of derivatives of 1,3,5-triazine disulphide, an accelerator of the mercapto group containing type and optionally an accelerator of the thiuram accelerator. By using this combination the disadvantage of a long heating time when using the 1,3,5-triazine disulphide alone will be obviate without reducing the high moduli.

3,816,324

BLEACHING COMPOSITIONS CONTAINING A N-ACYL AZOLE

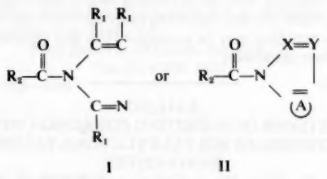
Leonard Wolfe Fine, 15 Grey Hollow Rd., Norwalk, Conn.; Martin Grayson, and Virginia Suggs Grayson, both of 91 Strawberry Hill Ave., Stamford, Conn. 06902

Continuation-in-part of Ser. No. 22,713, March 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 753,860, Aug. 20, 1968, abandoned, which is a continuation-in-part of Ser. No. 668,630, Sept. 18, 1967, abandoned. This application Mar. 29, 1972, Ser. No. 239,374

Int. Cl. C11d *7/54*

U.S. Cl. 252—186 **15 Claims**

A dry oxygen bleaching composition which is useful at relatively low water temperatures is provided. The composition contains a hydrogen peroxide releasing compound and an activating amount of an N-acyl azole of the formulas:



I II

wherein R_1 individually is hydrogen, alkyl, halogen or nitro; R_2 can be a wide variety of substituted or unsubstituted alkyl, alicyclic or aryl radicals; A is a mono- or di-substituted or unsubstituted 6-membered aromatic or N-heteroaromatic ring having 1–4 nitrogen atoms; and x and y are individually selected from nitrogen and C-R_1, and at least one of x and y is nitrogen. A typical composition is a mixture of sodium perborate and N-acetyl imidazole in a 1:1 mol ratio.

3,816,325

CHEMICAL LIGHTING SYSTEM COMPRISING A POLYMERIC CHEMILUMINESCENT COMPOSITION AND AN ACTIVATING LIQUID COMPRISING HYDROGEN PEROXIDE

Michael McKay Rauhut, Norwalk, and Andrew Milo Semsel, Ridgefield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 28,971, April 15, 1970, abandoned. This application May 8, 1972, Ser. No. 251,509

Int. Cl. G09k *3/00*

U.S. Cl. 252—188.3 CL **7 Claims**

This invention relates to a new chemiluminescent light system. It more particularly relates to such a system where the chemiluminescent material is incorporated in a swellable polymeric composition.

3,816,326

ELECTRONEGATIVELY SUBSTITUTED CARBOXYPHENYL OXALATES AS SUPERIOR CHEMILUMINESCENT MATERIALS

Laszlo Joseph Bollyky, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 18, 1969, Ser. No. 886,406

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 CL **10 Claims**

New compounds which are reactive with hydrogen peroxide in the presence of a solvent and a fluorescer to produce visible chemiluminescent light. The light capacity of the electronegatively substituted carboxyphenyl oxalate reaction is superior to that of the similarly electronegatively substituted phenyl oxalate reaction.

3,816,327

STRONTIUM HALOPHOSPHATE PHOSPHOR WHICH INCORPORATES A SMALL AMOUNT OF CALCIUM

Frank M. Vodoklys, Wayne, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1970, Ser. No. 7,076

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.6 P **8 Claims**

Improved strontium halophosphate phosphor having a preferred composition which emits primarily in the yellow-green region of the visible spectrum. A small amount of the strontium is replaced by calcium to improve the output of the phosphor.

3,816,328

METHOD OF PREPARING LUMINESCENT AND PHOTOCONDUCTIVE MATERIALS

Leon Levene, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 15, 1971, Ser. No. 208,393

Int. Cl. C09k *1/12, 1/54*

U.S. Cl. 252—301.6 S **18 Claims**

There is disclosed a process for forming luminescent or photoconductive materials wherein a gel process for producing oxide products which are glass precursors is employed and wherein effective luminescent amounts or effective photoconductive amounts of inorganic photoconductive or luminescent materials (phosphors) are added during the processing steps of the gel process. A granular luminescent or photoconductive oxide product is obtained and this product may be employed as is or it may be heated to a suitable temperature to convert it to a homogeneous glass containing the luminescent or photoconductive material dispersed therein or, if desired, it may be applied onto inorganic substrates to produce luminescent or photoconductive devices.

3,816,329

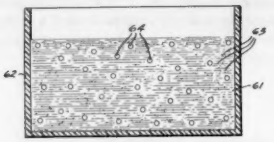
DISPERSING A WATER-IMMISCIBLE LIQUID IN AN AQUEOUS MEDIUM

John Thomas Kenney, Lawrence Township, Mercer County, and Frederic Alan Litt, Cranford, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 24, 1972, Ser. No. 256,550

Int. Cl. B01j *13/00*

U.S. Cl. 252—312 **6 Claims**



A method of dispersing a water-immiscible liquid in an aqueous medium is disclosed. At least one immiscible liquid is combined with a stable aqueous colloidal solution, formed by a controlled hydrolysis and nucleation reaction and comprising insoluble hydrous oxide particles of one or more selected elements, such solutions being exemplified in U.S. Pat. application Ser. No. 8,022, filed Feb. 2, 1970, now U.S. Pat. No. 3,657,003. The combined liquid source and colloidal solution are then subjected to a dispersive force to (1) fractionate the liquid source to form a plurality of immiscible liquid particles, and (2) disperse the liquid particles within the colloidal solution. Where the liquid source is initially fractionated in a suitable manner, the dispersive force then merely disperses the water-immiscible liquid particles.

3,816,330

METHOD OF PROTECTING COLLOIDAL SILICA AQUASOLS FROM BACTERIAL DEGRADATION

William D. Havens, Highland, Ind., and Sol Miller, Chicago, Ill., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 78,183, Oct. 5, 1970, abandoned. This application Aug. 23, 1972, Ser. No. 282,875

Int. Cl. B01j *13/00*; **C01b** *33/14*

U.S. Cl. 252—313 S **7 Claims**

Colloidal silica aquasols containing about 10–1000 parts per million of hexachlorophene are protected from contamination by microorganisms which cause undesirable changes in physical properties. The hexachlorophene is incorporated with agitation into colloidal silica sols as a solution in an aqueous alkali. This treatment prevents discoloration, bad odor, and slime formation and increases the shelf life of colloidal silica sols to more than one year.

3,816,331

CONTINUOUS ENCAPSULATION AND DEVICE THEREFOR

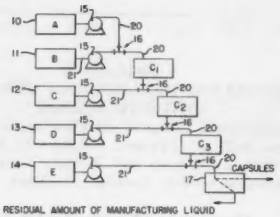
George T. Brown, Jr.; Donald B. Clark, both of Dayton, and Robert G. Bayless, Yellow Springs, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed July 5, 1972, Ser. No. 268,996

Int. Cl. B01j *13/02*; **B01f** *5/02*; **B44d** *1/02*

U.S. Cl. 252—316 **6 Claims**

Continuous encapsulation in a liquid capsule manufacturing vehicle by a process of liquid-liquid phase separation is disclosed. The continuous encapsulation is performed in a capsule manufacturing conduit which has a plurality of material introduction ports at spaced positions and a single material exit port and has a substantially constant cross-sectional shape and area throughout its length. Individual components required for encapsulating are continuously fed into the conduit at separate introduction ports and material in the conduit is maintained in turbulent-flow, steady-state, condition and



emerges from the material exit port as a dispersion of minute capsules in an aqueous vehicle. The introduction ports comprise reduced-diameter needles intersecting the conduit as turbulence-inducing bends.

3,816,332

SYNTHESIS GAS PRODUCTION

Charles P. Marion, Mamaroneck, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed Apr. 7, 1971, Ser. No. 132,018

Int. Cl. C01b *2/14*

U.S. Cl. 252—373 **7 Claims**

This is a process for the production of synthesis gas substantially free from entrained particulate carbon. The product gas is preferably produced substantially free from volatile hydrocarbon contaminants. A feedstock comprising fresh liquid hydrocarbon oil is introduced into a distillation zone and separated into a light liquid hydrocarbon fraction and a heavy liquid hydrocarbon fraction. The light hydrocarbon fraction in admixture with a preheated slurry produced subsequently in a gas scrubbing zone and comprising particulate carbon and said heavy liquid hydrocarbon fraction are introduced into the reaction zone of a free flow noncatalytic synthesis gas generator and reacted by partial oxidation with oxygen and steam at an autogenous temperature in the range of 1,500°–3,000° F. to produce synthesis gas comprising hydrogen, carbon monoxide, and appreciable amounts of entrained particulate carbon. The effluent gas from the reaction zone is cooled by indirect heat exchange and is then scrubbed free of said entrained particulate carbon in a gas scrubbing zone with said heavy liquid hydrocarbon fraction and carbon slurries thereof. The scrubbing zone is preferably maintained at a temperature and pressure so that undue stripping of volatile fractions from the scrubbing fluid is prevented. When desired, water and any vaporized hydrocarbon in the overhead from the scrubber may be condensed out and separated from the product gas stream.

3,816,333

METHODS OF INHIBITING CORROSION WITH CONDENSED POLYALKYLENEPOLYAMINE DERIVATIVES

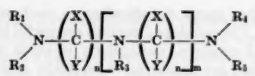
Thomas M. King, Creve Coeur, and Robert S. Mitchell, Webster Groves, both of Md., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 160,550, July 7, 1971, Pat. No. 3,714,067. This application June 30, 1972, Ser. No. 267,871

Int. Cl. C23f *11/10*, *11/16*

U.S. Cl. 252—389 A **19 Claims**

Condensed polyalkylenepolyamine derivatives having the formula



wherein R_1, R_2, R_3, R_4, R_5, X and Y are hereinafter defined, *n* is 1–15 and *m* is 1–20, alone or in combination with zinc, dichromate, certain thiols and 1,2,3-triazoles and mixtures thereof, are disclosed as inhibiting the corrosion of metals by oxygen-bearing waters.

3,816,334

LIQUID CRYSTALS STABLE AGAINST ELECTROLYTIC DECOMPOSITION AND DISPLAY DEVICE UTILIZING SAME

Yoshio Yamazaki, Shimosuwa-machi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 27, 1971, Ser. No. 184,167

Claims priority, application Japan, Sept. 28, 1970, 45-84524; Dec. 8, 1970, 45-108131; Dec. 29, 1970, 45-128121; Feb. 3, 1971, 46-3768; Mar. 25, 1971, 46-16879

Int. Cl. C09k *3/02*

U.S. Cl. 252—408 **17 Claims**

Liquid crystals stable against electrolytic attack, and, in particular, hydrolysis, have two aromatic nuclei linked through an azo grouping. One of the rings is substituted in the para position with an alkyl group, and the other is substituted in the para position with an alkoxyl or an acyloxy group. These materials resist electrolytic attack even in the presence of small quantities of water. Compositions having a mesomorphic range including or somewhat above room temperature are disclosed. An electro-optical display device utilizing such liquid crystal composition is described.

3,816,335

REVERSIBLY THERMOCHROMIC IONICALLY AND RADIATION CROSS-LINKED POLYMERS CONTAINING COBALTOUS IONS

Joseph H. Evans, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 809,951, March 24, 1969, abandoned. This application Oct. 14, 1971, Ser. No. 189,448

Int. Cl. C09k *3/00*

U.S. Cl. 252—408 **8 Claims**

Articles having the property of heat recoverability which change color at some stage during heating to cause their recovery. The articles may be translucent or transparent. Preferred articles are those made from ionomers containing certain metal salts. Crosslinked and other novel ionomeric compositions are also disclosed.

3,816,336

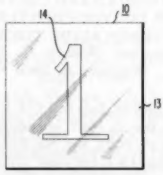
NOVEL ELECTRO-OPTIC DEVICES

Michael Thomas McCaffrey, Cranbury, and Joseph Anthony Castellano, North Brunswick, both of N.J., assignors to RCA Corporation, New York, N.Y.

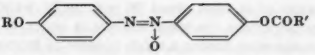
Filed June 15, 1972, Ser. No. 263,228

Int. Cl. C09k *3/08*

U.S. Cl. 252—408 **6 Claims**



Electro-optic devices comprising a thin layer of a liquid crystal composition containing a compound of the formula



wherein R and R′ are alkyl groups of 1–7 carbon atoms between conductive support plates, offer a wide range of use temperatures.

3,816,337

PROCESS FOR PREPARING A CATALYTIC COBALT CARBONYL REACTION PRODUCT

Seiji Usami; Kotaro Nishimura, both of Saitama, and Saburo Fukushi, Tokyo, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 68,751, Sept. 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 743,015, July 8, 1968, abandoned. This application July 10, 1972, Ser. No. 270,314

Int. Cl. B01j *11/82*; **B01d** *15/06*

U.S. Cl. 252—414 **10 Claims**

The invention relates to (1) the preparation of a catalyst comprising cobalt carbonyl in admixture with a metal substance selected from the group consisting of a metal of Groups I or II of the Periodic Table, useful as an oxo reaction catalyst by reacting the corresponding free metals or a compound thereof in a liquid medium with carbon monoxide and hydrogen in the presence of palladium, platinum or gold; (2) regenerating spent cobalt catalysts of the foregoing type by applying the same reagents and conditions to the spent catalyst.

3,816,338

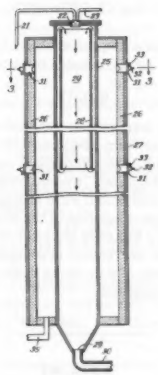
PROCESS FOR THE REACTIVATION OF POWDERED CARBON

Floyd L. Corson, Brookfield, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Feb. 8, 1971, Ser. No. 113,214

Int. Cl. B01j *11/02*; **C01b** *31/08*

U.S. Cl. 252—420 **6 Claims**



The present process describes a method for the reactivation of spent powdered carbon useful in the purification of wastewaters as well as other liquids. The present process obviates the disposal problems of spent carbon and the accompanying pollution of the environment. The present invention specifically discloses a continuous process for the reactivation of spent powdered carbon containing adsorbed organic matter, and having a particle size smaller than about 100 mesh, to a reactivation efficiency of at least about 80 percent, and a

product yield of at least about 90 percent by weight which comprises dispersing the spent carbon in water to form an aqueous suspension having a solids content of from about 20 percent to about 35 percent by weight; atomizing the suspension with steam and passing the atomized suspension in an atmosphere substantially free of oxygen through a radiantly heated reactor vessel having a wall temperature of from about 1,200°F to about 1,900°F within a time period of from about 5 to about 30 seconds by spraying the suspension into a first zone of the reactor vessel capable of heating the suspension to a temperature of at least about 1,200°F within a period of from about 3 to about 15 seconds, and then passing the heated suspension into a second zone of the reactor vessel capable of maintaining the temperature of the suspension between about 1,200°F and about 1,900°F for the remainder of its residence within the reactor vessel to pyrolyze the impurities within the carbon; and thereafter recovering the reactivated carbon. The carbon to and from the reactor is handled in a slurry form, eliminating dust losses.

3,816,339
URETHANE CATALYST

Daniel S. Raden, Palatine, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 22, 1972, Ser. No. 228,237
Int. Cl. C08g *22/38*
U.S. Cl. 252—426 **2 Claims**

A new catalyst for the acceleration of urethane polymerization consisting of a mixture of N,N-dimethyl-cyclohexylamine and N-methyl-dicyclohexylamine has been found. The new mixture has unique characteristics that are not expected from its components taken alone.

3,816,340
TRANSITION METAL COMPOSITIONS

Arthur Morris; Hugh Thomas, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 20, 1972, Ser. No. 236,198
Claims priority, application Great Britain, Mar. 22, 1971, 7471/71
Int. Cl. C07c *3/62*
U.S. Cl. 252—430 **9 Claims**

A transition metal composition which is the product of reacting a transition metal complex of empirical formula

$$R_mM^1X_p$$

with a substantially inert matrix material having a hydroxylic surface which is free from adsorbed water, wherein M^1 is a metal of Group VIIA of the Periodic Table, R is a hydrocarbon group or substituted hydrocarbon group, X is a monovalent ligand, and *m* and *p* are integers, *m* having a value from 2 up to the highest valence of the metal M^1 and *p* having a value from 0 up to 2 less than the valence of the metal M^1.

The compositions are useful heterogeneous catalysts, for example for reforming of petroleum hydrocarbons or as olefin disproportionation catalysts.

3,816,341
CRYSTALLINE METAL ALUMINOSILICATES HAVING HALIDE AND CERTAIN OTHER SALTS IRREVERSIBLY OCCLUDED THEREIN

Jule A. Rabo, Armonk; Marvin L. Poutsma, Ossining, and Gary W. Skeels, Jr., Brewster, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,853
Int. Cl. B01j *11/82, 11/78, 11/40*
U.S. Cl. 252—438 **18 Claims**

A method is provided for irreversibly occluding compositions consisting of salts such as metal halides, nitrates and the like, in crystalline metal aluminosilicates, such as the type X and Y zeolites. The salt doped zeolites are useful in the field of adsorption and catalysis, particularly in areas where these contact materials are employed in an acidic environment or corrosive environment.

3,816,342
PROCESS FOR PREPARING A CRYSTALLINE ALUMINOSILICATE ZEOLITE

Charles J. Plank, Woodbury, and Edward J. Rosinski, Almonesson, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 280,421, May 14, 1963, abandoned. This application July 31, 1968, Ser. No. 765,723
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z **15 Claims**

A method is provided for fluid catalytic cracking of hydrocarbons characterized by a composite catalyst of highly active crystalline aluminosilicate and a relatively less active matrix material.

3,816,343
KAOLINITE COATED WITH SYNTHESIZED LAYER-TYPE SILICATE MINERALS

George W. Hoffman, and William T. Granquist, both of Houston, Tex., assignors to N. L. Industries, Inc., New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,995
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 R **4 Claims**

Complexes of particles of kaolinite coated with a layer-type clay-like mineral as disclosed in U.S. Pat. No. 3,252,757, and having improved mechanical properties.

3,816,344
PROCESS FOR PRODUCING A CATALYST

Shozo Shimizu; Tetsumi Iwase, both of Okazaki; Hideki Hara; Ryuzo Hori, Toyota, and Shigenori Sakurai, Toyota, all of Japan, assignors to Toyota Jidoshe Kogyo Kabushiki Kaisha, Toyota-cho, Toyota-City, Aichi Prefecture, Japan

Filed June 23, 1972, Ser. No. 265,449
Claims priority, application Japan, Nov. 22, 1971, 46-93834
Int. Cl. B01j *11/40, 11/32, 11/08*
U.S. Cl. 252—455 R **10 Claims**

A film of a noble metal is deposited on the surface of a carrier without substantial penetration of the carrier by immersing the carrier first in a dilute solution of a salt of the noble metal, removing the carrier and heating and drying it to produce precipitation cores of the noble metal on the surface of the carrier, and then immersing the carrier with the precipitation cores in a solution of a noble metal salt which also contains a reducing agent for the salt and a stabilizer for the solution. The film of noble metal thus produced on the surface is adherent thereto and is highly active as a catalyzer for removing pollutants from the exhaust gas of an automobile.

3,816,345
METAL COMPOUND FILLED POLY(O-PHENYLENE-CARBIDE) OR POLY(M-PHENYLENECARBIDE) AND CARBON MADE THEREFROM

Robert D. Stephens, and William C. Kray, Jr., both of Richmond, Calif., assignors to Shell Oil Company, New York, N.Y.

Division of Ser. No. 52,735, July 6, 1970, Continuation-in-part of Ser. No. 688,975, Dec. 8, 1967, abandoned. This application May 17, 1972, Ser. No. 254,019
Int. Cl. G21f *1/08, 1/10*
U.S. Cl. 252—478 **3 Claims**

Poly(o-phenylenecarbide) and poly(m-phenylenecarbide) are novel polymers. They are fusible, soluble in a variety of

solvents, and are also convertible by thermal treatment at an elevated temperature to a carbon structure which is dimensionally stable and extremely resistant to loss of weight at temperatures as high as 1000°C. These novel polymers are capable of dissolving large amounts of compounds of certain transition metals. Upon thermal treatment, such solid solutions provide a carbon structure having metal compound homogeneously distributed therein as submicroscopic particles.

3,816,346

LUBRICANT FOR SPINDLES, NEEDLES OR TWISTER RINGS

Walter J. Coppock, Wallingford; James R. Amaroso, Newtown Square, both of Pa., and John Q. Griffith, III, Claymont, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 35,231, May 6, 1970, and a continuation-in-part of Ser. No. 60,642, Aug. 3, 1970, abandoned, and a continuation-in-part of Ser. No. 178,193, Sept. 7, 1971, and a continuation-in-part of Ser. No. 178,479, Sept. 7, 1971. This application Apr. 14, 1972, Ser. No. 244,274

Int. Cl. C10m *1/46*

U.S. Cl. 252—32.5 **4 Claims**

A composition which does not cause pin hole damage to cotton, and which is useful as a spindle oil, or as a twister ring oil, or as a needle oil, said composition comprising an effective amount of a friction reducing additive and a hydrorefined naphthenic or paraffinic lube or a hydrocracked hydroisomerized paraffinic lube or a hydrogenated polyolefin oil, said additive containing at least one alkyl ester of a carboxylic acid (preferably a methyl ester of a triglyceride of a fatty acid) or an alkyl acid phosphate or alkyl ammonium alkyl acid phosphate (e.g., an alkyl amine-neutralized, alkyl acid phosphate having alkyl groups in the C_{π}-C_{24} range).

3,816,347

SEMICONDUCTIVE ELASTOMERIC COMPOSITION OF CHLORINATED OR CHLOROSULFONATED POLYETHYLENE, ETHYLENE POLYMER AND CONDUCTIVE CARBON BLACK

Donald Richard Luh, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 2, 1972, Ser. No. 303,207

Int. Cl. H01b *1/06*; **C08f** *29/14*

U.S. Cl. 252—511 **10 Claims**

An elastomeric composition having beneficial utility for the formation of a vulcanized semiconductive layer on an electric cable (e.g., a cable having an ethylene polymer insulation layer), and comprising (A) an elastomer selected from chlorosulfonated polyethylene and chlorinated polyethylene, (B) an ethylene polymer selected from polyethylene and copolymers of ethylene with propylene and/or a diene, (C) conductive carbon black and (D) a peroxide curing agent. It is preferred also to add a plasticizer, an auxiliary curing agent which will enhance the state of cure, and an acid acceptor type of heat stabilizer for the elastomer.

3,816,348

COMPOSITIONS FOR STABLE LOW RESISTIVITY RESISTORS

Michael John Popowich, Niagara Falls, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 246,976, April 24, 1972, abandoned. This application July 25, 1972, Ser. No. 275,037

Int. Cl. H01b *1/06*

U.S. Cl. 252—520 **13 Claims**

In finely divided resistor compositions containing dielectric material and a resistive oxide which is a polynary oxide of the approximate formula $A_2B_2O_7$, improved compositions additionally comprising finely divided SiO_2 or Al_2O_3 to enhance stability of resistors made therewith. Resistors of such compositions fired on ceramic substrates.

3,816,349

PERFUME COMPOSITIONS CONTAINING AN ALKYL CYCLODODECA-KETONE

John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 752,145, Aug. 13, 1968, Pat. No. 3,754,036, which is a continuation-in-part of Ser. No. 667,398, Sept. 13, 1967, abandoned. This application May 23, 1972, Ser. No. 245,388

Int. Cl. C11b *9/00*

U.S. Cl. 252—522 **8 Claims**

Fragrance materials prepared by acylation of trimethyl cyclododecatriene, processes for producing same, and perfume compositions containing such materials.

3,816,350

PERFUME COMPOSITION CONTAINING INDANONE DERIVATIVES

John B. Hall, Rumson, N.J., assignor to International Flavors and Fragrances Inc., New York, N.Y.

Division of Ser. No. 851,049, Aug. 18, 1969, Pat. No. 3,773,836. This application Jan. 22, 1973, Ser. No. 325,677

Int. Cl. A61k *7/00*

U.S. Cl. 252—522 **4 Claims**

Indanone derivatives having the formula

wherein one of R_1 and R_2 is O and the other is H_2; Y is H or, taken together with X, an epoxy oxygen; one of the single dashed lines represents a double bond, which is present unless said epoxy oxygen is present, and when R_2 is O and the double bond is conjugated with R_2, X is H; perfume compositions containing such indanones and processes for producing same.

3,816,351

INDUSTRIAL CAR WASH COMPOSITION

Albert Jay Lancz, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 10, 1971, Ser. No. 206,907

Int. Cl. C11d *3/30*, *3/08*, *1/70*

U.S. Cl. 252—527 **7 Claims**

Powder car wash compositions containing a major amount of water soluble builder or mixture of builders and minor amounts of nonionic synthetic detergent and a stabilizing agent.

3,816,352

SPRAY DRIED ALPHA-OLEFIN SULFONATE DETERGENT COMPOSITIONS

Valentin R. Loureiro, 54 Oak St., Allendale, N.J. 07401, and Abraham Greenberg, 16 Crescent Dr., Parsippany, N.J. 07054

Filed Nov. 1, 1972, Ser. No. 302,689

Int. Cl. C11d *1/12*

U.S. Cl. 252—556 **5 Claims**

Dry powder compositions in the form of spray dried beads which are composed of alpha-olefin sulfonate, linear alkyl

benzene sulfonate, starch hydrolysate, magnesium sulfate, sodium chloride and a sulfate filler in certain relative proportions.

3,816,353

METHOD OF WASHING FABRICS USING POLYSULFONATED ALKYLPHENOLS

Samuel H. Sharman, Kensington, and Mitchell Danzik, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 34,886, May 5, 1970, Pat. No. 3,766,254. This application Apr. 1, 1971, Ser. No. 130,512

Int. Cl. C11d *1/22*

U.S. Cl. 252—558 **3 Claims**

Method of washing fabrics by contacting said fabrics with an aqueous solution containing as the detergent active material from about 0.01 to 0.10 percent by weight of polysulfonated alkylphenols produced by sulfonating C16–22 monoalkylphenols of not more than 20 mol percent para alkyl content with a sulfonating agent to incorporate an average of at least 1.5 sulfonic acid groups into molecule and neutralizing the product.

3,816,354

ALKYL AROMATIC POLYSULFONATE SURFACTANTS

Robert Steckler, Crofton; John M. Folliot, Baltimore, and Morris J. Warren, Bowie, all of Md., assignors to Alcolac Inc., Baltimore, Md.

Filed July 27, 1971, Ser. No. 166,633

Int. Cl. C11d *1/22*

U.S. Cl. 252—558 **10 Claims**

Mixed diphenylalkanes, which are obtained as a by-product in the process of alkylating benzene with olefins or partially chlorinated paraffins, are converted into low cost biodegradable surfactants by sulfonation with oleum, sulfur trioxide or chlorosulfonic acid, followed by neutralization with a basic material to yield a hazy or cloudy heterogenous liquid and converting the said liquid into a clear solution by the addition thereto of a lower alkyl alcohol, lower alkyl ketone, glycol, diacetone alcohol or dioxane.

The surfactants obtained are especially useful in the preparation of emulsion or suspension homo-and co-polymers that are resistant to polyelectrolytes and which possess excellent mechanical stability and shear resistance.

3,816,355

MACRORETICULAR SULFONATED PYRIDINE-DIVINYLBENZENE RESINS

David H. Clemens, Willow Grove, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 6, 1971, Ser. No. 205,364

Int. Cl. C08f *19/20*

U.S. Cl. 260—2.1 E **3 Claims**

Macroreticular sulfonated, vinyl nitrogen heterocyclic resins are effective adsorbents for SO_2 and/or SO_3 and also have ion-exchange properties. The resins are thus useful in preventing or controlling pollution since they can be used to remove the sulfur oxide contaminants from exit or stack gases from sulfuric acid manufacturing plants, power plants which burn fossile fuels, etc.

3,816,356

MELAMINE BASE POLYMERIC SEQUESTERING AGENT AND PROCESS

Edward Grannen, Upland, and Leon Robinson, Diamond Bar, both of Calif., assignors to Occidental Petrolium Corp., Los Angeles, Calif.

Filed Oct. 26, 1971, Ser. No. 192,570

Int. Cl. C08g *9/30*

U.S. Cl. 260—2.2 C **8 Claims**

Water-insoluble, cross-linked sequestering resins formed by reaction with chloroacetic acid and cross-linking of melamine. The active sequestering group on the resin is $-NCH_2COOH$ or salt thereof. A process for removing polyvalent ions from water with such a resin is provided.

3,816,357

METHOD OF PREPARING AN ACRYLATE-POLYMER-MODIFIED CELLULOSE FIBER

John Armistead Church, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 98,897, Dec. 16, 1970, abandoned, which is a division of Ser. No. 869,360, Oct. 24, 1969, Pat. No. 3,553,306. This application Dec. 3, 1971, Ser. No. 204,743

Int. Cl. C08b *15/00*

U.S. Cl. 260—2.2 R **4 Claims**

Acrylic and alkakacrylic acid can be graft copolymerized with cellulose fibers to form ion exchanging materials. The cellulose; acid monomer, and one component of an alkali persuifate-alkali thiosulfate redox catalyst coupled are mixed first. Then a strongly alkaline solution of the second catalyst component is added and the polymerization is permitted to continue to completion.

3,816,358

VULCANIZABLE RUBBER MIXTURES

Karl-Heinz Nordsiek, and Roland Streck, both of Marl, Germany, assignors to Chemische Werke Hals Aktiengesellschaft, Marl, Germany

Filed June 22, 1972, Ser. No. 265,167

Claims priority, application Germany, June 24, 1971, 2131354

Int. Cl. C08d *9/08*; **C08c** *9/14*, *9/04*

U.S. Cl. 260—4 R **14 Claims**

Vulcanizable rubber mixtures having improved room temperature hardness containing 2–20% by weight, calculated on the rubber, of a polyoctenamer or polydodecenamer.

3,816,359

POLYSILOXANE CARBAMATE COMPOUNDS

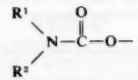
Charles Edward Creamer, Ridgefield, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 10, 1972, Ser. No. 252,330

Int. Cl. C08d *13/08*

U.S. Cl. 260—2.5 S **27 Claims**

An organopolysiloxane polymer free from hydroxyl radicals, which contains at least one carbamate radical having the formula



wherein R^1 is hydrogen or a monovalent hydrocarbon radical; R^2 is a monovalent hydrocarbon radical; said carbamate radical being directly bonded to an internal silicon atom of said polymer; as well as a method for preparing crosslinked siloxane foams by reacting polysiloxane carbamates with a hydroxy containing compound; a method for controlling, removing and/or recovering petroleum oil from water using said foams; and the crosslinked foamed products derived from said methods.

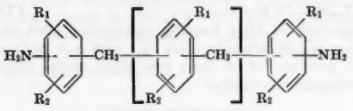
3,816,360

TRIETHANOLAMINE METHYLENEDIANILINE CURING AGENT AND THE PROCESS FOR USING SAME IN THE MANUFACTURE OF HIGH RESILIENT COLD MOLDED FOAM

Bernard Taub, Williamsville, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 11, 1972, Ser. No. 314,048
Int. Cl. C08g 22/44, 22/08, 22/02
U.S. Cl. 260—2.5 AM 6 Claims

A novel curing agent and method for using same. The curing agent comprises from about 60 to about 70 weight percent triethanolamine, from about 20 to about 35 weight percent of a selected aromatic diamine and from about 5 to about 20 weight percent of a mixture of at least two aromatic polyamine compounds, each having the general formula:



wherein R_1 and R_2 are independently at each occurrence H, halogen, lower alkyl or amine, x is 0 or an integer of 1 to 15 provided that if one of the compounds in said mixture is the selected aromatic diamine then said mixture comprises at least 40 percent by weight of two compounds having the above general formula other than said selected aromatic diamine. The process comprises using the novel curing agent in the manufacture of polyurethane foam.

3,816,361

TREATING RUBBER TO ENHANCE FIBER BONDING

Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 60,161, July 31, 1970, Pat. No. 3,644,268. This application Jan. 26, 1972, Ser. No. 221,105The portion of the term of this patent subsequent to Feb. 22, 1989, has been disclaimed.
Int. Cl. C08g 37/16; C08d 9/02, 9/04
U.S. Cl. 260—3 7 Claims

Fiber to rubber adhesion is enhanced by incorporating into the rubber a formaldehyde donor and a saturated polymer comprising alkylene bridged resorcinol. The saturated polymer results from introducing unsaturated radicals in the resorcinol nucleus.

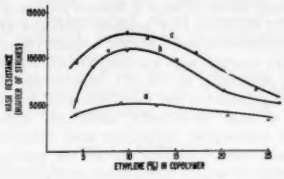
3,816,362

PROCESS OF PREPARING STABLE AQUEOUS ETHYLENE VINYL ESTER COPOLYMER EMULSIONS

Toyoji Tsuchihara; Youhei Yawaka, both of Kanagawa, and Takeshi Noguchi, Osaka, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Kobunshi Kagaku Kogyo, Osaka, both of, Japan

Continuation of Ser. No. 814,959, April 10, 1969, abandoned. This application May 19, 1971, Ser. No. 145,011
Int. Cl. C08f 1/88, 1/13, 37/16
U.S. Cl. 260—17 A 10 Claims

A process for preparing a stable aqueous ethylene-vinyl ester copolymer emulsion having a degree of polymerization of 600 to 4,000 and an ethylene content of 4 to 20 weight percent Emulsion polymerization is conducted at a temperature below 50°C in the presence of 0.02 to 0.2 percent of a redox catalyst until less than one percent of the monomer remains.



The copolymer emulsion is then aged at a temperature of 50°C to 100°C for 0.5 to 5 hours.

3,816,363

SAPONIFICATION RESISTANT, AQUEOUS SYNTHETIC RESIN DISPERSION

Paul Wicht, Fribourg, and Kurt Volken, Basel, both of Switzerland, assignors to Lanza Ltd., Gampel (Canton of Valais), Switzerland

Continuation of Ser. No. 732,035, May 27, 1968, abandoned. This application May 28, 1971, Ser. No. 148,235
Int. Cl. C08f 29/24
U.S. Cl. 260—17 A 12 Claims

A binder composition containing, in aqueous dispersion, a terpolymer comprising a vinyl ester, vinyl chloride and ethylene in which the weight ratio of vinyl chloride to ethylene is from 1:2 to 3:1. The composition is prepared by emulsion polymerization of the terpolymer components.

3,816,364

EPOXY BASE INK COMPOSITION

John W. Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 780,289, Nov. 29, 1968, which is a continuation of Ser. No. 297,671, July 25, 1963, which is a continuation of Ser. No. 120,499, June 29, 1961, abandoned. This application June 1, 1972, Ser. No. 258,739
Int. Cl. C08g 51/72, 51/04
U.S. Cl. 260—18 EP 10 Claims

There is disclosed a pigmented or non-pigmented, epoxy resin base, thixotropic, decorative ink composition having a printable viscosity and comprising a mixture of liquid and solid linear glycidyl epoxy resins derived from dihydric phenols, the weight ratio of liquid epoxy resin to solid epoxy resin ranging from about 7:1 to less than about 9:1, said ink exhibiting, when cured, a glossy, opaque finish having good permanency of adhesion.

3,816,365

ADDUCTS, CONTAINING EPOXIDE GROUPS, FROM POLYGLYCIDYL COMPOUNDS AND ACID POLYESTERS OF ALIPHATIC-CYCLOALIPHATIC DICARBOXYLIC ACIDS, PROCESS FOR THEIR MANUFACTURE AND USE

Rolf Schmid, Reinach/Basel-Land; Friedrich Lohse, Allschwil; Willy Fisch, Binningen, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 856,215, Sept. 8, 1969, abandoned. This application Nov. 9, 1972, Ser. No. 305,029The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.
Claims priority, application Switzerland, Sept. 12, 1968, 13677/68
Int. Cl. C08f 21/04; C08g 17/16; C08h 9/00
U.S. Cl. 260—22 D 19 Claims

New adducts, containing epoxide groups, from (1) polyglycidyl compounds which contain at least one carbocyclic or heterocyclic ring and (2) acid polyesters which are

obtained by esterification of aliphatic-cycloaliphatic higher dicarboxylic acids (manufactured by dimerization of unsaturated monomeric fatty acids with 14 to 24 carbon atoms in the molecule, preferably 16 to 18 carbon atoms, and optional subsequent hydrogenation of such a dimeric fatty acid) with C_2-C_{18} glycols or diglycols (for example ethylene glycol, 1,2-propylene glycol, diethylene glycol, neopentylglycol or 1,6-hexanediol) by reaction with warming to form an adduct, with 0.03 to 0.4, preferably 0.1 to 0.3, equivalents of the acid polyester being employed per 1 equivalent of epoxide groups. The curing of such (so-called) "advanced" epoxide compounds with carbocyclic carboxylic acid anhydrides yields flexible impact-resistant shaped articles the mechanical properties of which are largely temperature-independent.

3,816,366

ACRYLIC ADDUCTS OF AMINO-AMIDES OF MONOMERIC FATTY COMPOUNDS

Michael A. Laudise, Spring Lake Park, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Dec. 4, 1972, Ser. No. 312,069

Int. Cl. C08g *45/12*

U.S. Cl. 260—23 EP **8 Claims**

Adducts of an active acrylic compound and an amino-amide of monomeric fatty compounds which is a new curing agent for epoxy resins, particularly suitable for curing such epoxy resins in aqueous systems. The agents find utility in coatings systems such as paints but are useful in any area where thermoset epoxy systems find utility.

3,816,367

FLAME RETARDANT COMPOSITIONS

William A. Larkin, Morristown; John J. Kostrowski, Budd Lake, and Irving Touval, Edison, all of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 155,212, June 12, 1971, which is a continuation-in-part of Ser. No. 874,081, Nov. 4, 1969, abandoned. This application May 31, 1972, Ser. No. 258,326

Int. Cl. C08f *45/24*; **C09d** *5/14*

U.S. Cl. 260—29.6 R **15 Claims**

The combination of one or more antimony oxides specified antimonates, magnesium hydroxide and a halogen source imparts useful flame retardancy to a variety of synthetic polymers. In addition, the gradual increase in the viscosity of aqueous dispersions of the aforementioned combination which is observed using other magnesium compounds is not apparent using the hydroxide.

3,816,368

FILM OF A POLYETHYLENE-1,2-DIPHENOXY-ETHANE-4,4'-DICARBOXYLATE COPOLYMER

Hidehiko Kobayashi, and Kiichiro Sasaguri, both of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 20, 1971, Ser. No. 173,684

Int. Cl. C08g *17/14*

U.S. Cl. 260—47 C **3 Claims**

Films from a polyethylene-1,2-diphenoxyethane-4,4'-dicarboxylate copolymer with a comonomer selected from the group consisting of glycols other than ethylene glycol and dicarboxylic acid other than 1,2-bis(P-carboxyphenoxy) ethane contained in a proportion from one to 10 mole percent which have outstanding unidirectional characteristics, said film having in the direction of extrusion a tensile breaking strength from 1,800 to 3,500 kg./cm.^{2}, a tensile breaking elongation from 10 to 30 percent and a modulus of tensile elasticity from 57,000 to 100,000 kg./cm.^{2} and method for the preparation of the same which comprises stretching a substantially amorphous film from said copolymer at a temperature from 70° to 200°C. either simultaneously or successively in the direction of extrusion and in a direction rectangular thereto to a stretch ratio of from 3.0 to 5.0 in the former direction and a stretch ratio of from 1.5 to 3.0 in the latter direction and heat-setting the film thus stretched anisotropically along the two axes at a temperature from 150° to 220°C. are disclosed.

3,816,369

PROCESS FOR THE PREPARATION OF POLYAMIDES WITH ALKALI METAL DIHYDROGEN ORTHOPHOSPHATE AS CATALYST

Ieuan Thomas, and James Rodney Traynor, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 19, 1972, Ser. No. 299,176

Claims priority, application Great Britain, Nov. 8, 1971, 51717/71

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **12 Claims**

Production of fiber forming polyamides from aromatic diamines and dicarboxylic acids by a melt poly condensation in the presence of at least one alkali metal dihydrogen orthophosphate as catalyst.

3,816,370

ACRYLONITRILE POLYMERIZATION METHOD AND PRODUCTS

Leonard Edward Miller, Chagrin Falls, and Katsumi Hayashi, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 27, 1972, Ser. No. 238,669

Int. Cl. C08f *13/00*, *1/80*

U.S. Cl. 260—79.3 MU **4 Claims**

Polymers formed by interpolymerization in an aqueous acidic system of acrylonitrile or methacrylonitrile with sulfonic acid monomers (particularly acrylamidoalkanesulfonic acids and their salts) are improved as to basic dye affinity by carrying out the polymerization in the presence of a minor amount of an amine salt, especially a nitrate or chloride of a mono- or di-(lower alkyl)amine.

3,816,371

CONJUGATED DIENE BUTYL

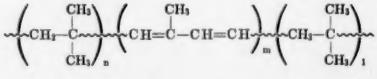
Francis P. Baldwin, Summit, N.J., and Alberto Malatesta, Brussels, Belgium, assignors to Esso Research and Engineering Company, Linden, N.J.

Filed Feb. 23, 1972, Ser. No. 228,727

Int. Cl. C08d *3/10*, *5/02*

U.S. Cl. 260—79.5 C **13 Claims**

Dehydrohalogenation of halogenated butyl to produce a butyl rubber having conjugated double bonds in the linear backbone. The composition is disclosed as having the predominant structure:



where $n+1$ represent the number of isoolefin units incorporated in the butyl rubber polymer backbone, and m represents the number of conjugated diolefin units present, substantially as isolated units. The composition is prepared by contacting a solution of halogenated butyl rubber with: (1) a soluble metal carboxylate, where the metal is selected from the metals of Groups Ib, IIb, IVa and VIII of the Periodic Table; (2) a soluble carboxylic acid; and (3) an oxide or hydroxide of a metal selected from the metals of Groups Ia or IIa of the Periodic Table.

3,816,372
URANIUM COMPLEXES AND PROCESS FOR PREPARING SAME

Gabriele Lugli, San Donato Milanese, and Gabriella Brandi, Milan, both of Italy, assignors to Snam Progetti S.p.A., San Donato, Milanese, Italy

Filed Aug. 20, 1971, Ser. No. 173,687
Claims priority, application Italy, Aug. 20, 1970, 28800/70
Int. Cl. C07f 5/00
U.S. Cl. 260—429.1 6 Claims

There are provided tetravalent uranium complexes containing metal carbonium σ bonds having the general formula

$$L_n U^{IV} R_{(4-n)}$$

wherein L is a ligand, e.g., cyclopentadienyl, allyl or cyclobutadiene, R is a hydrocarbon radical, e.g., aryl, alkyl, cycloalkyl, alkylaryl or arylalkyl and n is from 0 to 3. The new compounds are prepared by reacting the corresponding $L_n U^{IV} X_{(4-n)}$ wherein X is halogen with the corresponding organometallic reagent, $R—M^I$ or $R—M^{II}$. The new compounds are useful homogeneous phase catalysts, e.g., in the oligimerization of olefins and in absorption reactions, such as absorption of carbon monoxide.

3,816,373
BRANCHED AROMATIC POLYCARBONATE COMPOSITION

Thomas J. Hoogeboom, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 1, 1971, Ser. No. 194,508
Int. Cl. C08g 17/13
U.S. Cl. 260—47 XA 2 Claims

An intermediate composition consisting of the reaction product of at least 3 moles of a dihydric phenol with 1 mole of a trifunctional compound having as its functionality hydroxyl or carboxyl groups. The intermediate is reacted with a dihydric phenol and phosgene to prepare a haze-free branched polycarbonate polymer having non-Newtonian flow characteristics.

3,816,374
POLYACETYLENES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 118,467, Feb. 24, 1971, abandoned. This application Feb. 8, 1973, Ser. No. 330,497
Int. Cl. C08f 23/00
U.S. Cl. 260—47 UA 6 Claims

Certain polyacetylenes are provided having chemically combined ether linkages, or alkylene linkages and mixtures thereof, exhibiting improved compatability with various organic plasticizers. The polyacetylenes have been found to be melt extrudable, and convertible to carbonaceous films and molded carbon objects.

3,816,375
METHOD FOR CURING A PREPOLYMERIZED FURAN BINDER

Keith B. Bozer, and Lloyd H. Brown, both of Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 222,336
Int. Cl. C08g 1/12, 23/02
U.S. Cl. 260—67 FA 4 Claims

This invention relates to a process for curing a partially perpolymerized furfuryl alcohol-aldehyde binder with a specified acid salt of an aromatic amine, said binder useful for example in the preparation of fiber glass laminates.

3,816,376
CONTINUOUS MANUFACTURE OF AMINO RESIN SOLUTIONS

Friedrich Brunnmueller, Ludwigshafen; Hermann Schatz, Neustadt; Johann Mayer, Ludwigshafen, and Otto Grabowsky, Limburgerhof, all of Germany, assignors to Badische Anilin- & Sofa-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Continuation-in-part of Ser. No. 229,502, Feb. 25, 1972, abandoned. This application June 19, 1972, Ser. No. 264,233
Claims priority, application Germany, Feb. 25, 1972, 2109754
Int. Cl. C08g 9/10
U.S. Cl. 260—69 R 6 Claims

Continuous process for the manufacture of amino resin solutions, especially solutions of urea/formaldehyde resins, by contacting the reactants in a cascade of at least three stirred vessels with back-mixing of the solution whilst maintaining specific molar ratios of amino resin forming material to formaldehyde and specific pH ranges in the individual stirred vessels.

3,816,377
SOLID STATE POLYMERIZATION PROCESS

Yuzi Okuzumi, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 862,444, Sept. 30, 1969, abandoned. This application Sept. 21, 1972, Ser. No. 290,930
Int. Cl. C08g 17/003
U.S. Cl. 260—75 M 6 Claims

Linear condensation polyester resins are treated with a compound selected from metal salts of phosphorous acids, organophospnosphorus compounds, and phenolic compounds under solid state polymerization conditions to prevent sticking of the resin to itself or the equipment during solid state polymerization.

3,816,378
POLYESTER SALTS CONTAINING QUATERNARY AMMONIUM GROUPS

Edmund Schmadel, Mettmann, Germany, assignor to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Continuation of Ser. No. 188,940, Oct. 13, 1971, abandoned. This application June 11, 1973, Ser. No. 369,076
Claims priority, application Germany, Nov. 4, 1970, 2054097
Int. Cl. C08g 17/12, 17/04
U.S. Cl. 260—75 N 6 Claims

This invention relates to polyester salts containing quaternary ammonium groups, obtainable by polycondensation of N-alkyl-dialkanolamines with dicarboxylic acids, particularly maleic acid, and quaternization of the polyester with a haloacetic acid. Additional sulfonic acid groups can be introduced into the polyester molecule by reaction with an alkali metal hydrogen sulfite. The polyester salts are utilized as soil suspension agents in washing compositions.

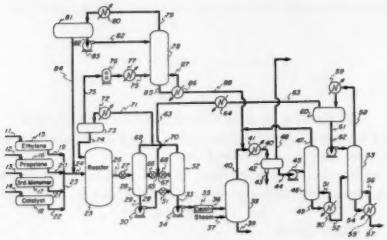
3,816,379
MONOMER AND SOLVENT RECOVERY IN POLYMERIZATION PROCESSES

Harry M. Rosenbaum, Morris Plains; Bruce R. Tegge, Madison, both of N.J.; Jacques Faure, Gruchet le Valasse, France, and James H. Love, Rockaway, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed July 26, 1971, Ser. No. 165,986
Int. Cl. C08f 1/88, 1/96
U.S. Cl. 260—80.78 8 Claims

Improvements in the process for preparing copolymers of ethylene, higher alpha-olefins and, optionally as termonomer,

a nonconjugated diene include subjecting the reactor effluent containing polymer cement, unreacted monomers, catalyst composition, and diluent-solvent to a first stripping operation, wherein recycled vaporous diluent-solvent is used as stripping medium, whereby substantially all unreacted light monomers and some diluent-solvent are taken as overhead. The first stripper bottoms are deashed and subjected to a second stripping operation employing steam as stripping medium. The overhead of this second operation, containing substantially all remaining diluent-solvent and some steam, is condensed; most water is withdrawn therefrom and the remaining water-saturated diluent-solvent is fractionated separating as overhead, any remaining water and any light impurities, and, as bottoms dry diluent-solvent and any heavy impurities. These bottoms are again fractionated separating as overhead, pure hot vaporous diluent-solvent which is recycled to the first



stripping operation as stripping medium, and, as bottoms heavy impurities and any heavy termonomer. The overhead of the first stripping operation may be partially condensed, separating as overhead light monomers, any light impurities, and some diluent-solvent. The condensate containing a major portion of diluent-solvent and minor amounts of light monomer may be directly recycled to the reactor. The noncondensed portion may be fractionated, thereby separating substantially all unreacted light monomer as overhead which may be recycled directly to the reactor. The bottoms, containing diluent-solvent and light impurities, may be combined with the overhead from the second stripping operation. This process results in improved and simplified monomer and diluent-solvent recycle and significant investment and operating cost savings due to improved heat integration and reduction of required processing equipment.

3,816,380

TELECHELIC COPOLYMERS OF DIENES AND POLYMERIZABLE FERROCENE OR CARBORANE COMPOUNDS

Samuel F. Reed, Jr., 49 Brookside Dr., Holland, Pa. 18966

Filed June 18, 1971, Ser. No. 155,669

Int. Cl. C08f *19/00*

U.S. Cl. 260—82.1 **7 Claims**

Copolymers of a diene selected from butadiene, isoprene, and chloroprene and a polymerizable monomer selected from ferrocenylmethyl methacrylate, isopropenylferrocene, 1-ferrocenylbutadiene, 2-ferrocenyl-butadiene, vinylcarborane, isopropenylcarborane and carboranylmethyl acrylate are disclosed along with preparative procedures therefor. Copolymerizations are carried out in solution (toluene or dioxane) with a suitable polymerization initiator selected from an azo compound to introduce either carboxyl or hydroxyl functionality into the copolymers.

3,816,381

PROCESS FOR COPOLYMIZING α-PINENE AND β-PINENE UTILIZING A $SiCl_4AlCl_3$ COCATALYST SYSTEM

Ronald Frank Phillips, New Milford, Conn., assignor to Arizona Chemical Company, New York, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,947

Int. Cl. C08f *1/72*

U.S. Cl. 260—88.2 D **3 Claims**

There is provided a process for effecting the copolymerization in a substantially anhydrous medium of α-pinene β-pinene in an inert solvent utilizing a mixture of silicon tetrachloride and aluminum trichloride as a polymerization catalyst system.

3,816,382

POLYALKENAMERS AND PROCESS FOR THE PREPARATION THEREOF

Roland Streck, and Heinrich Weber, both of Marl, Germany, assignors to Chemische Werke Huels AG, Marl, Germany

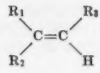
Filed Sept. 8, 1970, Ser. No. 70,497

Claims priority, application Germany, Sept. 8, 1969, 1945358

Int. Cl. C08f *1/80*

U.S. Cl. 260—93.1 **15 Claims**

The molecular weight of polyalkenamers produced by the ring-opening polymerization of cyclic olefins can be regulated by conducting at least a portion of the polymerization reaction in the presence of a hydrocarbon monoolefin of the formula



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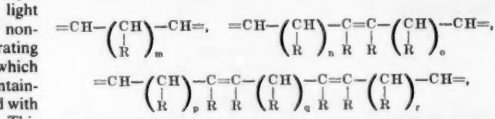
wherein R_1, R_2 and R_3 are hydrogen, saturated alkyl or cycloalkyl or aryl. Novel polyalkenamers thus produced include those formed of 2 to 50,000 polymer units of one of the formulae



and

wherein R is H, alkyl, cycloalkyl or aryl; *m* is 2,3 or 5–10; *n* and *o* are each 1–7 and their sum is 3–8; and *p*, *q*, and *r* are 1–2.

3,816,383

SEPARATION OF OLEFIN POLYMERS

Norbert Anthony Stotko, Denver, Colo., assignor to National Petro-Chemicals Corporation, New York, N.Y.

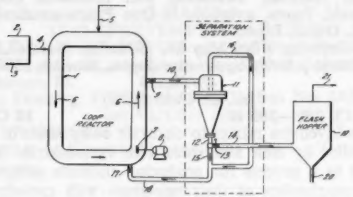
Filed May 1, 1972, Ser. No. 249,328

Int. Cl. C08f *1/88, 3/06*

U.S. Cl. 260—94.9 F **4 Claims**

Process for the separation of olefin polymers from product slurries removed from a polymerization zone, in which the slurry is passed directly into a cyclone separator, a portion of the underflow from the separator being taken off for recovery of the solid polymer and the overflow therefrom being combined with the residual portion of the underflow and recycled to the polymerization reactor. A pressure differential is main-

tained between the take-off and recycle points in the polymerization reactor whereby to maintain continual fluid



flow through the separator. Recycle of the diluent-rich overflow from the cyclone avoids blockage of the composite recycle stream.

3,816,384

POLYALKENAMERS AND PROCESS FOR THE PREPARATION THEREOF

Roland Streck, and Heinrich Weber, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed June 11, 1971, Ser. No. 152,373

Claims priority, application Germany, June 11, 1970, 2028716

Int. Cl. C07c *1/00*

U.S. Cl. 260—677 R **23 Claims**

Polyalkenamers are produced by a ring-opening polymerization of cyclic olefins employing a catalyst containing a tungsten or molybdenum compound and conducting the polymerization in the presence of an ethylenically unsaturated halogenated hydrocarbon wherein one of the double bonded carbon atoms is substituted by chlorine, bromine or iodine or halogenated alkyl or aryl and at least one hydrogen atom.

3,816,385

[ILE³,LEU⁴]-VASOPRESSIN ANALOGS AND INTERMEDIATES

Dieter Gillessen, Birsfelden, Josef Rudinger, Zurich, and Rolf Studer, Bottmingen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed June 1, 1972, Ser. No. 260,022

Int. Cl. A61k *27/00*; C07c *103/52*; C07g *7/00*

U.S. Cl. 260—112.5 **16 Claims**

Diuretically active nonapeptides which are analogs of vasopressin are disclosed. Particular embodiments include [Ile³,Leu⁴] - arginine-vasopressin and [Ile³,Leu⁴]-lysine-vasopressin. Intermediates useful in the preparation of the above compounds are also disclosed.

3,816,386

PURIFICATION PROCESS FOR GN-RH

Marc Theodore Hedlund, Waukegan, and Wilfrid Francis White, Arlington Heights, Ill., assignors to Abbott Laboratories, Chicago, Ill.

No Drawing. Filed June 20, 1972, Ser. No. 264,657

Int. Cl. C07c *103/52*; C07g *7/00*

U.S. Cl. 260—112.5 **5 Claims**

The present invention is directed to the preparation of Gn-RH from its precursor, the polyprotected decapeptide p-Glu-His-Trp-Ser-Tyr-Gly-Leu-Arg-Pro-Gly-NH_2 to obtain Gn-RH in a purity of 95% or better. The new procedure essentially includes two chromatographic steps in addition to the previously known deprotecting method.

3,816,387

PURIFICATION METHOD FOR TRH

John Wayne Cole, Deerfield, and Fred Ernest Kick, Lake Villa, Ill., assignors to Abbott Laboratories, Chicago Ill.

No Drawing. Filed July 19, 1972, Ser. No. 273,076

Int. Cl. C07c *103/52*; C07g *7/00*

U.S. Cl. 260—112.5 **6 Claims**

Crude TRH obtained by coupling the appropriate amino acids in proper sequence by classical method or by the solid phase method is purified by absorbing the TRH on a strongly acidic cation exchange resin, removing the liquid phase from the resin absorbate, cleaving the resin absorbate in an aqueous solution of a volatile water-soluble base with a pH between 9 and 12, removing the resin from the aqueous solution and recovering the pure TRH from the solution.

3,816,388

AZO COMPOUNDS FROM ALKYL ALPHA-ANILINO TOLUATES

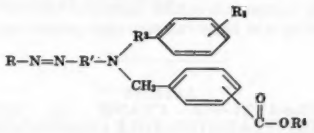
Max A. Weaver, Herman S. Pridgen, and Clarence A. Coates, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Nov. 5, 1968, Ser. No. 773,656, now Patent No. 3,660,374. Divided and this application Jan. 28, 1972, Ser. No. 221,761

Int. Cl. C09b *29/08, 29/24*; D06p *3/52*

U.S. Cl. 260—152 **11 Claims**

Monoazo compounds of the formula



wherein R is 2-thiazolyl, 2-benzothiazolyl, 2-thiadiazolyl or 2-thienyl; R′ is p-phenylene or 1,4-napthalene; R^2 is alkylene of 1 or 2 carbon atoms; R_3 is hydrogen, lower alkyl, lower alkoxy, halogen, hydroxy or lower alkoxycarbonyl; R^4 is lower alkyl which dyes are useful for dyeing polyester fibers in yellow to blue shades with improved build up, excellent brightness, superior light fastness, and superior resistance to sublimation.

3,816,389

PROCESS FOR TREATMENT OF OIL-CONTAINING SEEDS

Shigetoshi Mihara, Yanosuke Inaba, Tokyo, and Koichi Tachibana, Omiya, Tomio Endo, Ageo, Japan, assignors to Nakataki Pharm. Industry Co., Inc., Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 888,856, Dec. 29, 1969, now abandoned. This application Feb. 22, 1972, Ser. No. 228,333

Claims priority, application Japan, Dec. 30, 1968, 44/530

Int. Cl. A23j *1/12, 1/14*; C11b *1/10*

U.S. Cl. 260—123.5 **3 Claims**

Oilseed material such as oilseeds or oil-containing bran containing a substantial amount of undenatured protein and in excess of 6% by weight of water is subjected to grinding under wet milling conditions in the presence of from about 1.5 to 4, preferably about 2 to about 3, times its weight of methanol, ethanol, acetone or mixtures thereof, containing no more than 2% by weight of water, to remove from the material water, carbohydrates, pigment material, wax material, odor and taste principles, and free fatty acids, and to precondition the material by

opening the cell structure; separating the solid material from this first liquid extract and further extracting the solid material with a fat solvent, separating the oil-bearing extract and further separating the twice extracted solid material into a fine particle fraction high in undenatured protein and a coarse particle fraction high in fiber.

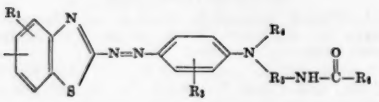
3,816,390

BENZOTHIAZOLYL-AZO META-ACYLAMIDO-ALKYLENE-ANILINE COMPOUNDS

Max A. Weaver, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 28, 1971, Ser. No. 167,041
Int. Cl. C09b *29/08, 29/36;* D06p *3/26*
U.S. Cl. 260—158 11 Claims

Monoazo compounds having a 2-benzothiazolyl diazo component and an aniline or tetrahydroquinoline coupling component in which the nitrogen atom of the coupling component bears a carboxylic acylamidoalkyl group of the formula



R_1, R_2, R_3, R_4, R_5 and R_6 are the usual dyestuff substituents. The compounds are particularly useful for dyeing polyamide fibers bright red to bluish-red shades and on which the compounds exhibit improved fastness to light and crocking and improved migration properties.

3,816,391

2-AMINO-4-ARYL-5-(2 - CYANO - 4,6 - DINITROPHENYLAZO)THIAZOLE COMPOUNDS

Clarence A. Coates, Jr., and Max A. Weaver, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 1, 1971, Ser. No. 203,823
Int. Cl. C09b *29/36;* D06p *3/52*
U.S. Cl. 260—158 8 Claims

Monoazo compounds having a 2-cyano-4,6-dinitrophenyl diazo component and a 2-amino-4-aryl-5-thiazolyl coupling component produce blue to green shades on polyester textile materials and exhibit good fastness and dyeability properties.

3,816,392

AZO COMPOUNDS CONTAINING A TRIAZOLYLTHIO GROUP

Max A. Weaver and Clarence A. Coates, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 772,846, Nov. 1, 1968, which is a continuation-in-part of Ser. No. 784,215, Dec. 16, 1968, both now abandoned. This application Nov. 9, 1971, Ser. No. 197,141
Int. Cl. C09b *29/36, 31/14;* D06p *1/15*
U.S. Cl. 260—157 25 Claims

Azo compounds having the formula

$$(A—N=N—B)—(S—T)_n$$

where A is a phenyl or phenyl or phenylazophenyl disperse dye diazo component; B is an aniline) naphthylamino, tetrahydroquinoline or indole disperse dye coupling component, T is a 1,2,4-triazol-3-yl radical and T is 1, 2 or 3 are used in dyeing cellulose acetate polyester and polyamide fibers in bright yellow to blue shades which are deep and level and excellent fastness to washing, cracking, light gas and sublimation.

3,816,393

CLATHRATE COMPOUNDS OF PROSTAGLANDINS OR THEIR ANALOGUES WITH CYCLODEXTRIN

Masaki Hayashi, Takatsuki, and Atsunobu Ishihara, Ibaraki, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

No Drawing. Filed May 26, 1971, Ser. No. 147,255
Claims priority, application Japan, June 10, 1970, 45/50,119
Int. Cl. C08b *19/00*
U.S. Cl. 260—209 R 18 Claims

This invention relates to clathrate compounds of prostaglandins or their analogues with cyclodextrin. It also relates to a process for producing clathrate compounds of prostaglandins or their analogues with cyclodextrin, characterized by reacting prostaglandins or their analogues react with cyclodextrin. Further the present invention relates to the use of clathrate compounds of prostaglandins or their analogues with cyclodextrin in pharmaceutical forms.

3,816,394

PROCESS FOR PREPARING A LACTULOSE POWDER BY UTILIZING PROTEIN

Taro Nagasawa, Mamoru Tomita, Yoshitaka Tamura, and Teruhiko Mizota, Tokyo, Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Oct. 29, 1971, Ser. No. 193,977
Claims priority, application Japan, May 31, 1971, 46/37,020
Int. Cl. C13k *9/00*
U.S. Cl. 260—209 R 4 Claims

A lactulose powder containing above 55% by weight lactulose, can be obtained by mixing an aqueous solution containing above 60% by weight of lactulose in total solid content, and an aqueous solution containing at least 5.0%, based on the weight of said lactulose, of protein, adjusting the pH of the resulting mixture to below 7.0 and drying.

3,816,395

ALKYL GLUCOSIDE REACTION PRODUCT

John P. Gibbons, Western Springs, and Lawrence Wondolowski, Lemont, Ill., assignors to CPC International Inc. Englewood Cliffs, N.J.

No Drawing. Filed Sept. 3, 1970, Ser. No. 69,440
Int. Cl. C07c *47/18, 69/32*
U.S. Cl. 260—210 R 9 Claims

Polyurethanes derived from glycoside carbamate polyethers. The glycoside carbamate polyethers are prepared by the reaction of a glycoside such as methyl glucoside with urea and with an alkylene oxide such as propylene oxide. The polyurethanes have flame-retardant properties.

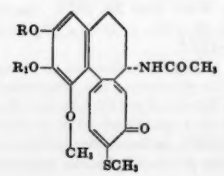
3,816,396

THIOCOLCHICINE GLUCOSIDE

Roland Bardoneschi, Le-Vert-Galant, and Georges Muller, Nogent-sur-Marne, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,138
Int. Cl. C07c *48/18*
U.S. Cl. 260—210 R 3 Claims

A novel process for the preparation of glucoside derivatives of thiocolchicine of the formula



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wherein one of R_1 and R is glucosyl and the other is methyl and to novel products produced therein, which have anti-contracturant activity.

3,816,397
11,12-EPOXYERYTHROMYCINS
John Soloman Tadanier, Chicago, and Jerry Roy Martin, Waukegan, Ill., assignors to Abbott Laboratories, Chicago, Ill.
No Drawing. Filed June 15, 1972, Ser. No. 263,056
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 E **3 Claims**

Covers 11,12-epoxyerythromycins which are useful as antibiotics.

3,816,398
11-O-METHANESULFONYLERYTHROMYCINS
John Soloman Tadanier, Chicago, and Jerry Roy Martin, Waukegan, Ill., assignors to Abbott Laboratories, Chicago, Ill.
No Drawing. Filed June 15, 1972, Ser. No. 263,087
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 E **5 Claims**

Covers 11-O-methanesulfonylerythromycins which have antibiotic activity.

3,816,399
1-AMINE NUCLEOSIDES
Gordon Shaw, Shipley, and Noel James Cusack, Cambridge, England, assignors to The University of Bradford, Bradford, Yorkshire, England
No Drawing. Filed July 8, 1971, Ser. No. 160,944
Claims priority, application Great Britain, July 14, 1970, 34,176/70; Nov. 3, 1970, 52,219/70
Int. Cl. C07c *95/04*
U.S. Cl. 260—211.5 R **12 Claims**

Acid addition salts of alkylidene-furanosylamines, particularly isopropylidene-furanosylamines, pharmacologically active derivatives thereof and a method for the preparation of said salts by the reaction of a pyranosylamine with a carbonyl compound. The acid addition salts of alkylidene-furanosylamines are useful as intermediates, for example, in the production of nucleosides having antibiotic, antitumour and immunosuppressant activities.

3,816,400
2'-*o*-METHYLADENOSINE 3',5'-CYCLIC PHOSPHATE
Dennis A. Shuman, Mission Viejo, and Roland K. Robins, Santa Ana, Calif., assignors to International Chemical & Nuclear Corporation, Pasadena, Calif.
No Drawing. Filed Nov. 22, 1971, Ser. No. 201,158
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R **1 Claim**

2'-*o*-Methyladenosine 3',5'-cyclic phosphate is prepared by selective phosphorylation of 2'-*o*-Methyladenosine, followed by dicyclohexylcarbodiimide cyclization. The compound is a potent phosphodiesterase inhibitor.

3,816,401
EXHAUST GAS CONVERSION PROCESS AND CATALYST
Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed May 25, 1972, Ser. No. 256,839
Int. Cl. B01d *53/00*
U.S. Cl. 423—213.5 **2 Claims**

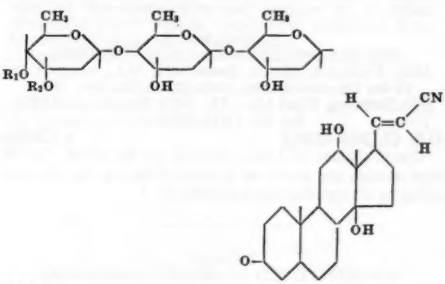
Process and catalyst for the catalytic conversion of nitrogen oxides, unburned hydrocarbons and carbon monoxide in internal combustion engine exhaust gases. The catalyst comprises essentially a composite of copper oxide and iron oxides which has been precalcined at high temperatures, between about 1200° and 2400° F. The composite catalyst is more active than either component alone, and more active than the same composites calcined at lower temperatures.

3,816,402
FIBERS OF CELLULOSE ESTER HAVING RANDOMLY DISTRIBUTED DICARBOXYLATE HALF-ESTER, HALF-4-AMINE DYE SITES
William K. Wilkinson, Waynesboro, Va., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.
No Drawing. Filed May 8, 1972, Ser. No. 251,119
Int. Cl. C08b *3/06, 3/16*
U.S. Cl. 260—225 **11 Claims**

Cellulose ester fibers and films having excellent receptivity for basic dyes are produced by preparing a conventional spinning dope of cellulose acetate and volatile solvent, then mixing phthalic anhydride or other cyclic anhydride and trimethylamine or other tertiary amine with the spinning dope to react with the cellulose acetate, and dry spinning or casting the resulting dope directly into fibers or films. The modified cellulose acetate products have dicarboxylate substituents in the form of a half-ester, half-salt with the tertiary amine, and dye uniformly to bright washfast colors with basic dyes.

3,816,403
DIGITOXSYL ACRYLONITRILE DERIVATIVES
Wolfgang Eberlein, Biberach (Riss), and Joachim Heider, Warthausen-Oberhofen, Germany, Walter Kobinger, Vienna, Austria, and Willi Diederen, Biberach (Riss), Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany
No Drawing. Filed Apr. 28, 1972, Ser. No. 248,523
Claims priority, application Germany, May 5, 1971, P 21 22 209.3
Int. Cl. C07c *173/00*
U.S. Cl. 260—210.5 **5 Claims**

Compounds of the formula



wherein

R_1 is hydrogen or lower alkyl,

R_2 is hydrogen, lower alkyl or aliphatic acyl of 1 to 5 carbon atoms, and

R_1 and R_2 together are

where A and B are each lower alkyl;

the compounds are useful as cardiotonics.

3,816,404
PREPARATION OF CAPROLACTAM
Mahmoud S. Kablaoui, Wappingers Falls, Richard F. Love, Fishkill, and Roger G. Duranleau, Ardonia, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed Dec. 8, 1971, Ser. No. 206,197
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A **17 Claims**

A method for preparing caprolactam by the steps of (1) nitro-oxidizing cyclohexene to 2-nitrocyclohexanone, (2) cleaving and esterifying 2-nitrocyclohexanone with an alcohol to form an alkyl 6-nitrohexanoate and (3) catalytically hydrogenating and cyclizing the nitroester to caprolactam.

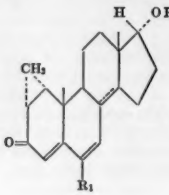
3,816,405

1α,2α-METHYLENE-ANDROSTANE DERIVATIVES

Arthur Friedrich Marx, 12, Florence Nightingalelaan, Delft, Netherlands

No Drawing. Filed Oct. 18, 1972, Ser. No. 298,512
Claims priority, application Great Britain, Oct. 19, 1971, 48,648/71
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.5 31 Claims

New 1α,2α-methylene-androstane derivatives of the general formula:



in which the dotted line between the 8- and 14-positions indicates the optional presence of a double bond, and wherein R_1 represents a hydrogen or a halogen atom or a methyl group, and R_3 represents a hydrogen atom or an acyl group derived from a pharmaceutically acceptable organic carboxylic acid, and processes for the preparation of these new compounds, are disclosed.

These new 1α,2α-methylene-androstane derivatives are therapeutically useful, possessing properties which result in a selective anti-androgenic activity.

3,816,406

O-ARYL OXIMES OF 3-KETO STEROIDS

Allen Frederick Hirsch, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

No Drawing. Filed Mar. 19, 1973, Ser. No. 342,903
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.5 4 Claims

O-aryl oximes of 3-keto steroids are described. The O-aryl oximes are active as post-coital agents for the suppression of reproduction in mammals.

3,816,407

N-SUBSTITUTED AZABICYCLONONANES

Howard C. Zell, Philadelphia, Pa., and Paul M. Borick, Cranford, N.J., assignors to Arbrook, Inc., Arlington, Tex.

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,940
Int. Cl. C07d *41/04*
U.S. Cl. 260—239 BA 6 Claims

N-substituted azabicyclo[3.2.2]nonanes in the form of the free base, acid addition salts or quaternary ammonium salts are disclosed where the N-substituent is either: (1) a 2-hydroxybenzyl attached through its methylene portion and also containing on the benzyl two or three other substituents, namely, a chloro or cyclopentyl or benzyl in the 3-position, a chloro or fluoro in the 5-position, and hydrogen or chloro in the 6-position, exemplified by 3-(3-chloro - 5 - fluoro - 2-hydroxybenzyl)-3-azabicyclo[3.2.2]nonane, 3 - (3-benzyl-5-chloro-2-hydroxybenzyl)-3-azabicyclo[3.2.2]nonane, 3 - (5 - chloro-3-cyclopentyl-2-hydroxybenzyl) - 3-azabicyclo[3.2.2]nonane, 3-(2-hydroxyl-3,5,6-trichlorobenzyl)-3-azabicyclo[3.2.2]nonane, 3-(3,5-dichloro-2-hydroxybenzyl)-3-azabicyclo[3.2.2]nonane; or (2) a straight chain C_{8-14} alkyl group, exemplified by 3-[octyl or decyl or dodecyl or tetradecyl]-3-azabicyclo[3.2.2]nonane. The acid addition and quaternary ammonium salts have antimicrobial activity when used in a carrier such as aqueous-organic solvent solution, soaps, ointments, plastics, adhesives, sutures, and paints.

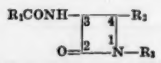
3,816,408

NOVEL AZETIDINONES AND THEIR USE TO INHIBIT LACTAMASE ENZYMES THAT DESTROY β-LACTAM ANTIBIOTICS

Jan Mieczyslaw Zygmunt Gladych and Clive Wilfred Theodore Hussey, London, England, assignors to Allen & Hanburys Limited, London, England

No Drawing. Filed Apr. 19, 1971, Ser. No. 135,498
Claims priority, application Great Britain, May 8, 1970, 22,314/70
Int. Cl. C07d *25/02*
U.S. Cl. 260—239 A 6 Claims

Compounds of the formula:



in which R_1 represents an aryl, arylalkyl, or aryloxyalkyl group in which the aryl group or moiety may optionally be substituted by one or more alkyl, alkoxy, haloacetamido, nitro or amino groups or halogen atoms and the alkyl chain may optionally be substituted by an azido, amino, carboxyl, or alkoxy group; or R_1 represents a group (in which Z represents H, NH_2, or N_3) of the following formula:

R_2 represents a phenyl or naphthyl group which may optionally be substituted with one or more alkoxy groups or halogen atoms; and R_3 represents H or an alkyl group containing from 1 to 4 carbon atoms or R_3 may be an acyl or alkoxy carbonyl group, and acid addition salts thereof.

These compounds inhibit lactamase enzymes which destroy β-lactam antibiotics.

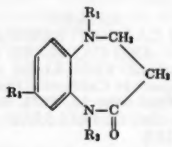
3,816,409

5 - (PYRIDYL OR PHENYL) - 1H - 2,3,4,5 - TETRAHYDRO - 1,5 - BENZODIAZEPIN - 4 - ONES AND SALTS THEREOF

Adolf Bauer, Ingelheim am Rhein, Karl Heinz Weber, Gau-Algesheim, Herbert Merz and Karl Zeile, Ingelheim am Rhein, Rolf Giesemann, Bingen (Rhine), and Peter Danneberg, Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 44,571, June 8, 1970. This application May 24, 1972, Ser. No. 256,353
Int. Cl. C07d *53/04*
U.S. Cl. 260—239.3 B 8 Claims

Compounds of the formula



wherein

R_1 is hydrogen, acyclic hydrocarbyl of 1 to 6 carbon atoms, ω-hydroxy-alkyl of 2 to 3 carbon atoms, cycloalkyl of 3 to 6 carbon atoms—methyl or formyl,

R_2 is α-pyridyl, phenyl, o-halo-phenyl, o-nitro-phenyl or o-trifluoromethyl-phenyl, and

R_3 is bromine, hydroxyl, trifluoromethyl, nitro, cyano or, when R_1 is ω-hydroxy-alkyl of 2 to 3 carbon atoms or

formyl or, when R_2 is o-fluoro-phenyl, o-bromophenyl, o-nitrophenyl, o-trifluoromethylphenyl or α-pyridyl, also chlorine,

and nontoxic, pharmacologically acceptable acid addition salts thereof; the compounds as well as their salts are useful as sedatives (tranquilizers) and anticonvulsives in warm-blooded animals.

3,816,410

PREPARATION OF LACTAMS

Roger G. Duranleau, Ardonia, and Richard F. Love, Fishkill, N.Y., assignors to Texaco (Inc.), New York, N.Y.

No Drawing. Filed Dec. 8, 1971, Ser. No. 206,199
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A **19 Claims**

A method for preparing lactams by the steps of (1) cleaving and esterifying a cyclic alpha-nitroketone with an alcohol to form an alkyl omega-nitroester and (2) catalytically hydrogenating and cyclizing the nitroester to a lactam.

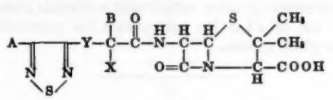
3,816,411

THIADIAZOLYL AMINO PENICILLINS

Jozsef Schawartz, Tamas Szuts, and Peter Szentmiklosi, Budapest, Hungary, assignors to Chinoin Gyógyszer-és Vegyészeti Termékek Gyára Rt., Budapest, Hungary

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,397
Claims priority, application Hungary, Aug. 12, 1970, Cl–1024
Int. Cl. C07o *99/16*
U.S. Cl. 260—239.1 **4 Claims**

A process for the preparation of a penicillin compound of a salt thereof of the formula I



(I)

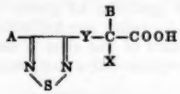
wherein

A is hydrogen, alkyl having 1 to 4 carbon atoms, aralkyl selected from the group which consists of benzyl and phenylethyl unsubstituted or substituted with chloro, methoxy or ethoxy, or aryl selected from the group which consists of phenyl and naphthyl unsubstituted or substituted with chlorine, methoxy or ethoxy;

B is hydrogen or alkyl having 1 to 4 carbon atoms,

Y is oxygen or sulfur,

X is hydrogen or alkyl having 1 to 4 carbon atoms, which comprises reacting 6-aminopenicillanic acid or a trialkylxylyl ester thereof with a carboxylic acid of the formula II



(II)

or a reactive derivative thereof selected from the group which consists of the azides, acid chlorides, acid bromides and anhydrides of said carboxylic acid.

3,816,412

STEROIDAL AZOLIDE-1-CARBOXYLATES

Kenneth Earl Fahrenholtz, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 28, 1972, Ser. No. 248,363
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.5 **9 Claims**

Azolide-1-carboxylates and thionecarboxylates of a 3β-hydroxy, 17β-hydroxy or 21-hydroxy steroid which are useful as progestational, androgenic, esterogenic, anabolic and/or antigonadotropic agents.

3,816,413

PROCESS FOR THE PRODUCTION OF HALOGEN-CONTAINING v-TRIAZOLE COMPOUNDS

Rudolf Kirchmayr, Binningen Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed June 3, 1970, Ser. No. 43,167
Int. Cl. C07d *55/02*
U.S. Cl. 260—240 C **4 Claims**

2,4-substituted-5-halogeno-v-triazoles are produced by reacting a corresponding v-triazole-1-oxide with hydrogen chloride or hydrogen bromide. The v-triazoles are brighteners for high-molecular organic materials.

3,816,414

***o*-ACYLAMINO-N-(2 - THIAZOLIN - 2 - YL AND 2-THIAZIN-2-YL) ANILINES AND DERIVATIVES THEREOF**

Venkatachala Lakshmi Narayanan, Hightstown, and Rudiger Dieter Haugwitz, Titusville, N.J., assignors to E. R. Squibb & Sons, Incorporated, Princeton, N.J.

No Drawing. Filed Nov. 3, 1972, Ser. No. 303,448
Int. Cl. A61k *27/00*; C07d *91/24, 93/06*
U.S. Cl. 260—240 J **10 Claims**

o-Acylamino - N - (thiazolin - 2 - yl and thiazin-2-yl) anilines and related compounds and their methods of preparation are disclosed. In addition, useful compositions and methods for employing said compositions as anthelmintics are taught.

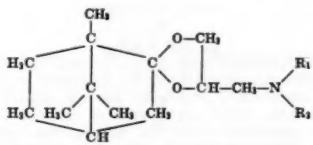
3,816,415

DERIVATIVES OF 1,7,7 - TRIMETHYL - 2 - NORBORNANE-2'-SPIRO-1',3'-DIOXOLANE

Claude P. Fauran, Paris, Jeannine A. Eberle, Chatou, Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon-la-Foret, France, assignors to Delalande S.A., Courbevoie (Hauts-de-Seine), France

Claims priority, application France, Mar. 18, 1971, 7109448
Int. Cl. C07d *87/40*
U.S. Cl. 260—247.7 E **7 Claims**

Compounds of the formula



in which

R_1 and R_2 are alkyls having 2 or 3 carbon atoms, or

is pyrrolidino, piperidino, morpholino or hexamethyleneimino

are prepared by reacting camphor with epibromohydrin to form 4'-bromomethyl-1,7,7-trimethyl-2-norbornane-2'-spiro-1',3'-dioxolane, which is then reacted with

The compounds possess hypotensive, vasodilatory, spasmolytic, diuretic, analgesic, anti-inflammatory and antidepressive properties.

3,816,416

α,ω-DI-s-TRIAZINYL PERFLUOROOXAALKANES

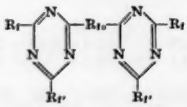
Thomas S. Croft, St. Paul, and Joseph La Mar Zollinger, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Jan. 21, 1971, Ser. No. 108,624

Int. Cl. C07d 55/50

U.S. Cl. 260—248 CS **9 Claims**

α,ω-Di-s-triazinyl *n*-perfluorooxaalkanes, useful as hydraulic fluids or lubricants, of the formula:



where R_f and $R_{f'}$ are perfluorinated organic radicals and R_{fo} is a straight chain (or normal) perfluoroalkyleneoxyalkylene radical, are prepared by condensation between precursor perfluoroalkyl amidine and perfluoroalkyleneoxy-alkylene dinitriles and cyclodehydration of the resulting perfluoro di-imidoylamidine with a precursor perfluoroalkanoic or oxyalkanoic anhydride.

3,816,417

TRIS-(p-CARBOPHENOXYPHENYL) CYANURATE

James Economy, Eggertsville, Steve G. Cottis, Amherst, and Bernard E. Nowak, Lancaster, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

No Drawing. Original application Dec. 12, 1970, Ser. No. 96,234, now Patent No. 3,772,250. Divided and this application Sept. 13, 1972, Ser. No. 288,844

Int. Cl. C07d 55/50

U.S. Cl. 260—248 CS **1 Claim**

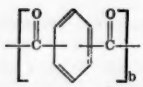
Branched, wholly aromatic polyesters of Formula I

(I)

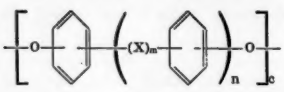
wherein R^1, R^2 and R^3 each consist essentially of a plurality of moieties selected from the group having the Formulas II, III and IV

(II)

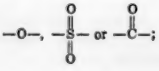
(III)



(IV)



and wherein X is



m is 0 or 1; *n* is 0 or 1; *a* is 0–40; *b* is 0–20; *c* is 0–20; and *a*+*b*+*c* is 2–40. The compound tris(p-carbophenoxyphenyl) cyanurate, which may be made by the reaction of phenyl p-hydroxybenzoate with cyanuric chloride at elevated temperature, accompanied by liberation of HCl, is disclosed to be useful in the manufacture of prepolymers to be converted to other polymers of the type previously described.

3,816,418

TRIMERIZATION OF NITRILES

Gordon H. Miller, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 29, 1972, Ser. No. 319,581

Int. Cl. C07d 55/50

U.S. Cl. 260—248 CS **13 Claims**

Aromatic nitriles, such as terephthalonitrile, isophthalonitrile, benzonitrile, etc., are trimerized to the corresponding 1,3,5-triazine by heating the nitrile in the presence of metal ferri- or ferrocyanide.

3,816,419

SUBSTITUTED s-TRIAZINES

Barrington Cross, Rocky Hill, and Richard William Feeny, Hightstown, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 27, 1972, Ser. No. 301,561

Int. Cl. C07d 55/20

U.S. Cl. 260—249.9 **8 Claims**

The invention is novel substituted s-triazine compounds and the use of s-triazine compounds for controlling undesirable plant species.

3,816,420

3,6-DIALKYLISOTHIAZOLO[3,4-d]PYRIMIDIN-4(5H)-ONES

Loren Kenneth Gibbons, Medina, and Arthur Albert Ramsey, Middleport, N.Y., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed Oct. 15, 1971, Ser. No. 189,780

Int. Cl. C07d 51/46

U.S. Cl. 260—256.5 R **8 Claims**

Herbicidal compounds consisting of 3,6-dialkylisothiazolo[3,4-d]pyrimidin - 4(5H) - ones exhibits pre-emergence and post-emergence herbicidal activity, controlling effectively a wide spectrum of grassy and broad-leafed plant species at rates below one-half pound per acre. The synthesis of members of this class is described in detail, and the utility of representative compounds is exemplified.

3,816,421

DIHYDROISAZOLOPYRIMIDINE HERBICIDES

Loren Kenneth Gibbons, Medina, and Arthur Albert Ramsey, Middleport, N.Y., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed Oct. 15, 1971, Ser. No. 189,781

Int. Cl. C07d 51/46

U.S. Cl. 260—256.4 F **9 Claims**

Certain 3,6-dialkyl-6,7-dihydroisazolopyrimidin-4(5H)-ones, specifically 3,6-dialkyl-6,7-dihydroisoxazolo[5,4-d] pyrimidin-4(5H)-ones, 3,6-dialkyl-6,7-dihydroisothiazolo [5,4-d]pyrimidin - 4(5H) - ones, 3,6-dialkyl-6,7-dihydroisoxazolo[3,4-d]pyrimidin-4(5H)-ones, and 3,5-dialkyl-

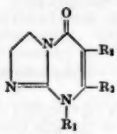
6,7 - dihydroisothiazolo[3,4-d]pyrimidin-4(5H)-ones, exhabit pre-emergence and post-emergence herebicidal activity, controlling effectively a wide spectrum of grassy and broad-leafed plants. The synthesis of *tert*-butyl-6,7-dihydro - 6 - methylisoxazolo[3,4-d]pyrimidin-4(5H)-one and other members of this class is described in detail, and the utility of representative compounds is exemplified.

3,816,422
2,3-DIHYDRO-OXO-IMIDAZO[1,2-a]PYRIMIDINES AND SALTS THEREOF

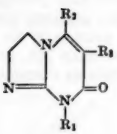
Helmut Stahle, Herbert Köppe, and Werner Kummer, Ingelheim am Rhein, and Wolfgang Hoefke, Budenheim, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Claims priority, application Germany, July 8, 1971, P 21 33 998.0
No Drawing. Filed June 30, 1972, Ser. No. 268,215
Int. Cl. C07d *51/46*
U.S. Cl. 260—256.4 F **3 Claims**

Compounds of the formula

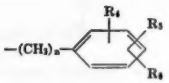


or



wherein

R_1 is

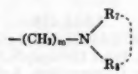


where

n is 0 or 1, and

R_4, R_5 and R_6, which may be identical to or different from each other, are each methyl, ethyl, fluorine, chlorine, hydrogen, bromine, trifluoromethyl, cyano or methoxy

one of R_2 and R_3 is



where

m is an integer from 0 to 3, inclusive,

R_7 is hydrogen or lower alkyl,

R_8 is lower alkyl, and

R_7 and R_8, together with each other and the nitrogen atom to which they are attached, are piperidino, piperazino, morpholino or pyrrolidino,

and the other of R_2 and R_3 is methyl or ethyl,

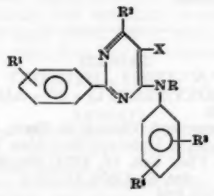
and their non-toxic, pharmacologically acceptable acid addition salts; the compounds as well as the salts are useful as regulators of the central nervous system and especially as hypotensives.

3,816,423
2-ARYL-4-AMINO-5-CYANO PYRIMIDINE DERIVATIVES

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to, American Home Products Corporation, New York, N.Y.

No Drawing. Filed Aug. 31, 1972, Ser. No. 285,153
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 N **3 Claims**

Compounds of the formula:



in which

R, R^1 and R^2 are independently selected from the group consisting of —H and lower alkyl radicals,

R^3 and R^4 are independently selected from the group consisting of —H, lower alkyl and lower perfluoroalkyl radicals,

X is a member selected from the group consisting of —CN and

radicals, and

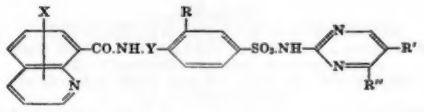
pharmaceutically acceptable acid addition salts thereof, possess central nervous system depressant and anti-inflammatory properties when administered to warm blooded animals.

3,816,424
BENZENESULFONAMIDOPYRIMIDINES

Rudi Weyer, Frankfurt am Main, Walter Aumuller, Kelkheim, Taunus, Roland Schweitzer, Falkenstein, Taunus, Helmut Weber, Frankfurt am Main, and Manfred Hubner, Ludwigshafen am Rhine, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 15, 1972, Ser. No. 226,530
Int. Cl. C07d *57/00*
Claims priority, application Germany, Feb. 17, 1971, P 21 07 557.0
U.S. Cl. 260—256.5 R **5 Claims**

New sulfonamidopyrimidines with hypoglycemic properties having the formula



in which

X represents hydrogen, chlorine, bromine, methyl, methoxy

Y represents —CH(CH₃)—CH₂—, or, preferably,

—CH₂—CH₂—

R represents hydrogen or, together with Y, a bridge of 3 or 4 carbon atoms,

R' represents alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, alkoxy, cycloalkoxy, alkoxyalkyl, alkoxyalkoxy, alkylmercapto, alkylmercaptoalkyl, the alkyl containing, in any case from 1 to 4 carbon atoms and the cycloalkyl, in any case, 5 to 8 carbon atoms,

R'' represents hydrogen, lower alkyl, R'' and R' together being able to form a ring of from 3 to 5 methyl groups,

and physiologically tolerable salts thereof and processes for their preparation.

3,816,425

POLYOL N,N'',N''-TRIS[2 - HYDROXY - 3 - (BETA-CYANOETHOXY)PROPYL] - N' - AMINOETHYL-PIPERAZINE

Stephen E. Cantor and Thomas J. Brett, Jr., Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Feb. 18, 1972, Ser. No. 227,647
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 CN **1 Claim**

This invention relates to polyols containing cyanoalkyl ethers, such polyols being useful in the production of elastomeric and rigid urethane polymers and prepolymers thereof.

3,816,426

1-(5-PHENYL-4-OXO-2-OXAZOLIN-2-YL) PIPERAZINES

Cheuk Man Lee, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 84,481, Oct. 27, 1970, now abandoned. This application July 5, 1972, Ser. No. 268,966
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 C **8 Claims**

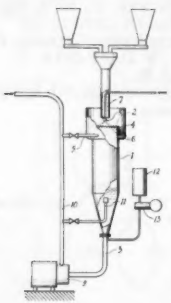
Covers 1 - (5-phenyl-4-oxo-2-oxazolin-2-yl)piperazines which are useful as anti-depressants.

3,816,427

APPARATUS FOR CONTINUOUSLY DISSOLVING PULVERULENT MATERIAL IN A LIQUID

Willi Löliger, Grunegg, and Rudolf Schmied, Tonisbach, both of Konolfingen, Switzerland

Claims priority, application Switzerland, Mar. 22, 1972, 4,243/72
Filed Mar. 14, 1973, Ser. No. 341,293
Int. Cl. B01d *11/02*
U.S. Cl. 23—271 **7 Claims**



Method and apparatus for continuously dissolving a pulverulent material in a liquid. The pulverulent material is sprayed with the finely divided liquid and the solution is caused to flow in a thin layer along the inner surface of a chamber.

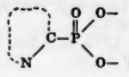
3,816,428

DIHYDROACRIDINE PHOSPHONATES

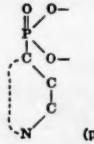
Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application May 31, 1968, Ser. No. 733,328, now abandoned. Divided and this application Jan. 18, 1971, Ser. No. 107,052
Int. Cl. C07d *37/16*
U.S. Cl. 260—279 R **7 Claims**

Nitrogen-heterocyclic phosphonates wherein the phosphonate group is ortho- or para- to the nitrogen heterocyclic group, where the compounds are characterized as follows:



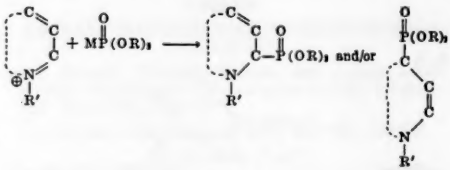
(ortho substituted) and



(para substituted)

wherein the dotted line represents a cyclic structure which cyclic structure may be the sole cyclic structure, or may be attached to other cyclic groups.

These nitrogen heterocyclic phosphonates are prepared by reacting an aromatic nitrogen heterocyclic compound, wherein the nitrogen atom is in the form of a salt or a quaternary, with a phosphite salt, preferably in the form of esters of the phosphite as exemplified by the following equation:



and/or

These compounds which may be characterized as phosphonates of dihydroaromatic nitrogen heterocyclics have many uses including their use as biocides such as bacteriocides, herbicides, corrosion inhibitors, chelating agents, etc.

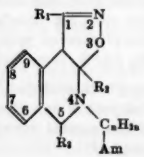
3,816,429

TETRAHYDROISOXAZOLO(5,4-c)ISOQUINOLINES

Neville Finch, West Orange, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Aug. 10, 1971, Ser. No. 170,638
Int. Cl. C07d *85/22*
U.S. Cl. 260—288 R **4 Claims**

4-Aminoalkyl - 3a,4,5,9b - tetrahydroisoxazolo[5,4-c] isoquinolines, e.g. those of the formula



R_1=aliphatic, cycloaliphatic, araliphatic or aromatic radical
R_2=H or alkyl radical
R_3=H or R_1, n=2–7
Am=an amino group
or salts thereof are tranquilizers.

3,816,430

N,N' - (NAPHTHYLENEDIOXYDIETHYLENE)BIS [DI(LOWER)ALKYLAMINES] AND THE SALTS THEREOF

Arthur A. Santilli, Havertown, Anthony C. Scotese, King of Prussia, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Oct. 30, 1972, Ser. No. 302,379
Int. Cl. C07c *93/06*
U.S. Cl. 260—570.7 **4 Claims**

N,N' - (naphthylenedioxydiethylene)bis[di(lower)alkylamines] have anti-inflammatory activity.

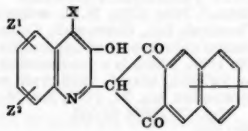
3,816,431

BROMINE OR CHLORINE CONTAINING QUINOPHTHALONE PIGMENT

Kenzo Konishi, Nishinomiya, Teijiro Kitao, Tondabayashi, Masaru Matsuoka and Hisayoshi Shiozaki, Sakai, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

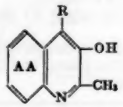
No Drawing. Filed Mar. 28, 1972, Ser. No. 238,957
Claims priority, application Japan, Aug. 21, 1971, 46/63,630
Int. Cl. C07d *33/36*
U.S. Cl. 260—289 QP **4 Claims**

A pigment having the formula:

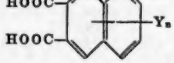


wherein
X represents hydrogen or halogen,
Y represents halogen,
Z^1 represents hydrogen, halogen, lower alkyl or lower alkoxy,
Z^2 represents hydrogen or halogen, and
n represents an integer of 1–4,

can be prepared by reacting a quinoline derivative having the formula:



wherein R represents hydrogen, carboxyl or halogen, and wherein the benzene ring A may be substituted with halogen, lower alkyl, or lower alkoxy with a halogenated naphthalene-2,3-dicarboxylic acid having the formula:



wherein Y represents halogen, and n represents an integer of 1–4; or the corresponding anhydrides or imides thereof; in one embodiment, the product is further halogenated.

3,816,432

PRODUCTION OF VINYL SUBSTITUTED AROMATICS FROM METHYL SUBSTITUTED AROMATICS

Raymond A. Franz, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 15, 1969, Ser. No. 791,489
Int. Cl. C07d *31/20*
U.S. Cl. 260—290 V **9 Claims**

Vinyl substituted aromatic compounds are produced in a non-catalytic process by contacting a methyl substituted aromatic compound with methyl chloride or methylene chloride. The contacting is carried out at a temperature of from about 700 to about 950° C. at a pressure of not more than four atmospheres absolute.

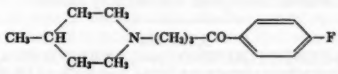
3,816,433

4-FLUORO - γ - (4-METHYLPIPERIDINO)-BUTYROPHENONE AND ITS PHARMACEUTICALLY ACCEPTABLE SALTS

Sven Erik Harry Hernestam and Nils Olov Bruno Sterner, Malmo, Sweden, and Jorgen Buus Lassen, Soborg, Denmark, assignors to AB Ferrosan, Malmo, Sweden

No Drawing. Continuation-in-part of application Ser. No. 725,134, Apr. 29, 1968, which is a continuation-in-part of applications Ser. No. 385,058, July 24, 1964, and Ser. No. 536,293, Mar. 22, 1966, all now abandoned. This application Oct. 5, 1970, Ser. No. 78,289
Int. Cl. C07d *29/20*
U.S. Cl. 260—293.8 **2 Claims**

The invention relates to a basic ketone compound having the formula:



and pharmaceutically acceptable salts thereof. The compound of the invention has valuable pharmaceutical properties.

3,816,434

4-[3-(4 - PHENYL - PIPERIDINO) - 2 - HYDROXYPROPOXY]-BENZOPHENONES

Albrecht Edenhofer, Riehen, Henri Ramuz, Birsfelden, and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application May 21, 1970, Ser. No. 39,505, now Patent No. 3,706,755, dated Dec. 19, 1972, which is a continuation-in-part of application Ser. No. 567,354, July 25, 1966, now abandoned. Divided and this application Apr. 19, 1972, Ser. No. 245,609
Int. Cl. C07d *29/20*
U.S. Cl. 260—293.8 **2 Claims**

Novel lower alkyloxy benzophenone derivatives and processes for their preparation are disclosed. These novel benzophenone derivatives are useful as psychosedative agents.

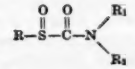
3,816,435

PYRIDYLMETHYLSULFINYLCARBAMATES

Francis Harry Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

No Drawing. Filed Aug. 14, 1972, Ser. No. 280,382
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 F **9 Claims**

Herbicidal active sulfoxide compounds are described herein. The compounds have the following generic formula:



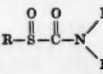
wherein R is selected from pyridylalkyl, R_1 and R_2 can be the same or different and can be selected from the group consisting of lower alkyl, cycloalkyl, alkenyl and benzyl.

3,816,436
CERTAIN PYRIDYLMETHYLSULFINYL-CARBAMATES

Francis Harry Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

No Drawing. Filed Aug. 14, 1972, Ser. No. 280,394
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 F **3 Claims**

Herbicidal active sulfoxide compounds are described herein. The compounds have the following general formula:



wherein R is selected from pyridylalkyl, R_1 and R_2 taken together form a heterocyclic ring structure having from 2 to 10 carbon atoms.

3,816,437
THIENO[2,3-g]INDAZOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 22, 1972, Ser. No. 317,519
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 B **4 Claims**

Substituted 4,5-dihydro-2H-furano and thieno indazoles, e.g., 4,5 - dihydro-3-(4-pyridyl)-2H-thieno[2,3-g]indazole are useful as nonestrogenic anti-fertility agents.

3,816,438
2H[1]-BENZOTHIEPINO[5,4-c]-PYRAZOLES AND [1]-BENZOTHIOPYRANO[4,3-c]-PYRAZOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 22, 1972, Ser. No. 317,544
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 B **5 Claims**

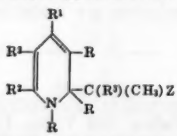
Fused heterocyclic pyrazoles, e.g., 4,5 - dihydro-3-(4-pyridyl)-2H[1]-benzothiepino[5,4-c]-pyrazole, are useful as non-estrogenic antifertility agents.

3,816,439
SUBSTITUTED 1,2-DIHYDROPYRIDINES AND PROCESS FOR PREPARING SAME

Reinhard A. Sulzbach, Burghausen, and Abul F. M. Iqbal, Germany, assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 14, 1971, Ser. No. 153,062
Claims priority, application Switzerland, June 19, 1970, 9,393/70
Int. Cl. C07d *31/46*
U.S. Cl. 260—294.9 **2 Claims**

Substituted 1,2-dihydropyridines of the formula



in which R and R^2 are selected from the group consisting of hydrogen, —NH_2, silyl, silyl linked via oxygen, silyl linked via nitrogen, sulfamyl, organosulfonamido, nitro, organic radical, organic radical linked via oxygen, organic radical linked via sulfur, organic radical linked via nitrogen, organic radical linked via —SO— and organic radical linked via —SO_2—; with the proviso that the R^2 groupings when joined together form an ortho condensed cyclic or polycyclic hydrocarbon; R^1 is a member selected from the group consisting of hydrogen, —NH_2, silyl, silyl linked via oxygen, silyl linked via nitrogen, sulfamyl, organosulfonamido, nitro, organic radical, organic radical linked via oxygen, organic radical linked via sulfur, organic radical linked via nitrogen, organic radical linked via —SO— organic radical linked via —SO_2—, mercapto, sulfino and sulfo; R^3 is a member selected from the group consisting of hydrogen, halogen and methyl; and Z is a member selected from the group consisting of halogen and an electron-withdrawing group containing an electronegative atom doubly or triply bonded to a more positive atom which atom is singly bonded to the carbon atom attached to the pyridine ring. Exemplary of such compositions is 1,4-bis (trimethylsilyl)-2-(1-cyanoethyl)-1,2-dihydropyridine. The compounds of the invention are useful as antioxidants for polyphenyl ethers, as stabilizers for halogenated polyhydrocarbons, as curing agents for silicones and epoxide resins, as dyeing improvers for polyesters and as fuel additives for imparting hypergolic properties.

3,816,440
PYRIDYL KETIPATE LACTONES AND DERIVATIVES

Blaine M. Sutton, Hatboro, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Application Sept. 7, 1972, Ser. No. 287,189, which is a division of application Ser. No. 160,190, July 6, 1971, now Patent No. 3,714,173, dated Jan. 30, 1973. Divided and this application Aug. 30, 1973, Ser. No. 393,234
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 R **4 Claims**

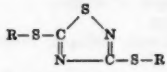
Pyridyl ketipate lactones and derivatives having antiarthritic activity prepared by alcoholysis of an appropriate pyridyl substituted dilactone.

3,816,441
DIARYL PERTHIOCYANATES

Raymond Seltzer, New City, N.Y., assignor to M&T Chemicals Inc., Greenwich, Conn.

No Drawing. Continuation-in-part of application Ser. No. 64,116, July 30, 1970, which is a continuation of application Ser. No. 727,068, May 6, 1968, both now abandoned. This application Jan. 24, 1972, Ser. No. 220,383
Int. Cl. C07d *91/60*
U.S. Cl. 260—302 SD **2 Claims**

Novel heterocyclic compounds of the general formula:



in which R is an aryl or alkaryl hydrocarbon radical containing at least one activating substituent, are prepared by reacting a stable metal salt of perthiocyanic acid with a monofunctional compound

RX

in which X is a replaceable functional group, and recovering said heterocyclic compound and the novel compounds produced by the method.

3,816,442
PULVERIZED POLYMER SOLUTION OR DISPERSION, A POLYMER POWDER, A PROCESS OF PRODUCTION THEREOF AND A POWDER COATING TECHNIQUE

Karl Mueller, Kufstein, Austria, assignor to Ciba-Geigy A.G., Basel, Switzerland

No Drawing. Filed Mar. 23, 1972, Ser. No. 237,560
Claims priority, application Austria, June 16, 1971, A 5,194/71
Int. Cl. C08g *51/34, 51/40, 51/44*
U.S. Cl. 260—30.2 **13 Claims**

This invention relates to solid thermoplastic polymer containing particles. From these particles pure, porous polymeric particles of medium to high particle fineness can be obtained. These polymer particles can be applied

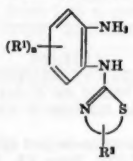
by means of a powder coating technique on the surface of an object and sintered thereon to form a thermoplastic film. These porous polymer particles can be further used as filter elements, chromatographic absorbers and in rotational casting.

3,816,443
4-(BENZOTHIAZOL-2-YL)FLUORO PHENYL-ACETIC ACIDS
Conrad P. Dorn, Jr., Plainfield, N.J. assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Feb. 17, 1972, Ser. No. 227,286
Int. Cl. C07d *91/44*
U.S. Cl. 260—304 **2 Claims**

4-(benzothiazol-2-yl)phenylacetic acids, esters, amides and the nontoxic pharmaceutically acceptable salts thereof and processes for their preparation are described. The substituted 4-(benzothiazol-2-yl)phenylacetic acids are useful as anti-inflammatory compounds. In general they are prepared by condensing an o-aminothiophenol with a benzoic acid carrying a para substituent convertible to an acetic acid residue by conventional techniques.

3,816,444
THIAZOLINYL DERIVATIVES OF *o*-PHENYLENEDIAMINES
Venkatachala Lakshmi Narayanan, Hightstown, and Rudiger D. Haugwitz, Highland Park, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
No Drawing. Filed Feb. 28, 1972, Ser. No. 230,121
Int. Cl. C07d *91/26*
U.S. Cl. 260—306.7 **7 Claims**

Thiazolinyl and thiazinyl derivatives of *o*-phenylenediamines are provided having the structure



wherein R^1, R^2 and n are as defined hereinafter and which are useful as disinfectants, and as starting materials in the preparation of benzimidazoles which are useful as anthelmintic agents, and also dyes.

3,816,445
CERTAIN 2-SUBSTITUTED-Δ^3-THIAZOLINES
Paul Dubs, Zug, and Mario Pesaro, Zurich, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.
No Drawing. Filed June 26, 1972, Ser. No. 266,099
Claims priority, application Switzerland, June 30, 1971, 9,596/71
Int. Cl. C07d *91/24*
U.S. Cl. 260—306.7 **7 Claims**

Novel Δ^3-thiazolines flavourants having the formula

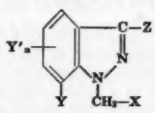
wherein R is a C_3 to C_7 alkyl group, the benzyl group or the 2-methylthioethyl group, and a process for preparing the compounds.

3,816,446
[α-(3-TRIFLUOROMETHYLPHENOXY)-4-CHLORO-BENZYL]HETEROCYCLES
William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Apr. 11, 1972, Ser. No. 243,480
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 F **1 Claim**

[α-(3 - Trifluoromethylphenoxy)-4-chlorobenzyl]heterocycles which are prepared by the cyclization of an appropriately substituted [α-(3-trifluoromethylphenoxy)-4-chlorobenzyl] compound. The products reduce the concentration of cholesterol, triglycerides and other lipids in blood serum and are therefore useful in the treatment of atherosclerosis.

3,816,447
N^1-SUBSTITUTED INDAZOLES
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.
No Drawing. Continuation-in-part of application Ser. No. 201,194, Nov. 22, 1971, now abandoned. This application Feb. 7, 1972, Ser. No. 224,286
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 C **9 Claims**

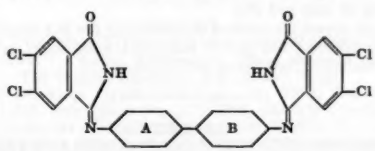
Compounds that have the structural formula



wherein X represents —OR, halogen, or thiocyanato; Y represents halogen, nitro, $—SO_2R$, acoyl, acoylamino, lower alkyl, lower alkoxy, carboalkoxy, or trihalomethyl; Y′ represents halogen, nitro, $—SO_2R$, acoyl, acoylamino, aroylamino, lower alkyl, lower alkoxy, carboalkoxy, trihalomethyl, alkyleneimino, or (halobenzylidene)amino; Z represents hydrogen, halogen, acoylamino, or alkyleneimino; R represents hydrogen, alkyl, haloalkyl, phenyl, or substituted phenyl wherein the substituent is halogen, hydroxyl, alkyl, or nitro; and n represents a number in the range of zero to three are biocides that are of value in the preservation of aqueous compositions that are subject to deterioration resulting from bacterial action. Illustrative of these compounds is N^1-hydroxymethyl-5,7-dichloroindazole.

3,816,448
BIS-(3-IMINO-ISOINDOLINONE)PIGMENTS
Peter Bitterli, Reinach Basel-Land, and Fritz Kehrer, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland
No Drawing. Filed Aug. 24, 1971, Ser. No. 174,496
Claims priority, application Switzerland, Sept. 15, 1970, 13,648/70, 13,649/70; Sept. 16, 1970, 13,720/70
Int. Cl. C07d *27/50*
U.S. Cl. 260—325 **3 Claims**

Sparingly soluble compounds of the general formula



where the nuclei A and B bear chlorine atoms or methyl radicals as substituents are suitable for use as pigments, notably for the mass pigmentation of plastics.

3,816,449
PROCESS FOR PREPARING 2 - OXOSPIRO [INDOLINE-3,4′-THIOCHROMANS]
Vasken Paragamian, Dresher, Pa., assignor to McNeil Laboratories, Inc.
No Drawing. Original application Apr. 23, 1971, Ser. No. 137,043, now Pat. No. 3,723,459. Divided and this application July 21, 1972, Ser. No. 274,028
Int. Cl. C07d *27/40*
U.S. Cl. 260—325 **1 Claim**

6,7 - dihydro - 12H[1]benzothiepino[5,4 - b]indole - 5-oxides are utilized as precursors for making certain 2-oxo-

spiro[indoline-3,4'-thiochroman] derivatives, of which the ester and nitrile derivatives are useful as inhibitors of gastric acid secretion and the acid derivatives are useful as precursors for making the ester derivatives.

3,816,450

PTERIDINE DERIVATIVES AND METHOD

Hamish Christopher Swan Wood, Bearsden, and Alexander Stuart, Bromley, England, assignors to The University of Strathclyde, Glasgow, Scotland

No Drawing. Application July 6, 1971, Ser. No. 160,216, now Patent No. 3,725,408, which is a division of Ser. No. 794,786, Jan. 28, 1969, now Patent No. 3,635,978. Divided and this application Oct. 27, 1972, Ser. No. 301,309

Int. Cl. C07d *27/52*

U.S. Cl. 260—326 A 1 Claim

A compound 2-amino-4-hydroxy-6-hydroxymethyl-7,7-dimethyl-7,8-dihydropteridine, or tautomeric forms thereof and pharmaceutically acceptable salts thereof. The compound is useful as a bacteriostat and in antibacterial products. The compound has useful activity against *Cl. perfringens* and *Derm. dermatonomous.*

3,816,451

MALEIMIDE DERIVATIVES AS PLANT GROWTH REGULATORS

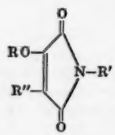
Aldo Joseph Crovetti, Lake Forest, and Donald Murl Lynch, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Nov. 2, 1971, Ser. No. 199,393

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.5 FM 21 Claims

Covers maleimide derivatives having the following general formula:



where R is selected from the group consisting of alkyl, benzyl, naphthyl, phenyl, and substituted phenyl, R' is selected from the group consisting of hydrogen, phenyl and substituted phenyl and R'' is selected from the group consisting of halo and RO.

Also covers the method of employing the just described derivatives as plant growth regulators. Specifically, covers the method of their use as herbicides.

3,816,452

ORGANOPHOSPHORUS COMPOUNDS CONTAINING N-BONDED PYRROLE GROUPS

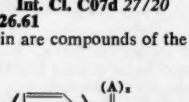
Joseph J. Mrowca, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 25, 1972, Ser. No. 220,705

Int. Cl. C07d *27/20*

U.S. Cl. 260—326.61 30 Claims

Disclosed herein are compounds of the formula



wherein:

A=O or S

R'=H or lower alkyl

R=substituted or unsubstituted hydrocarbyl groups of up to 12 carbons

x=0, 1

m=0, 1

y=1, 2

z=1, 2

$y+z$=3;

and a process therefor comprising reacting an alkali metal pyrrole with the appropriate halophosphorus reactant and, when x=1, reacting an oxygen or sulfur oxidant with the product of said reaction.

3,816,453

PROCESS FOR PREPARING NAPHTHALIDE INDICATOR DYES

Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,615

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.13 R 14 Claims

This invention relates to a method of synthesizing indicator dyes by reacting a 1-naphthol and a phthalaldehydic or a naphthalaldehydic acid to form the corresponding 1:1 adduct, and reacting the adduct with a 1-naphthol or an indole to form a leuco dye intermediate which is oxidized to the corresponding indicator dye product. In a preferred embodiment, 3,3-disubstituted (na)phthalides are prepared wherein the 3,3 substituents comprise carboxy-substituted naphthol radicals which includes the additional step of ionizing the leuco dye intermediate prior to the oxidation step.

3,816,454

N-PHENYL AMIDINES

Yao-Hua Wu and Walter G. Lobeck, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 47,589, June 18, 1970. This application May 22, 1972, Ser. No. 255,701

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.15 9 Claims

N-phenyl amidines which have diuretic, antithrombogenic, smooth muscle relaxant and anti-inflammatory properties have been discovered. They are prepared by reacting a substituted aniline with a carboxamide selected from the group consisting of amides and lactams in the presence of phosphorus oxychloride. Typical examples of substituted N-phenyl amidines thus obtained are 5-methyl-2 - (N-phenylbenzylamino) - 1-pyrroline, 2-(N-phenylbenzylamino) - 1 - pyrroline and 3-[(N-1-pyrrolin-2-yl-*p*-anisidino)methyl]indole. Indole substituted N-phenyl amidines can be rearranged to provide iminopyrrolindinyl-indoles which are useful as diuretic, antithrombogenic and smooth muscle relaxant agents. In the case of 3-[(N-1-pyrrolin-2-yl-*p*-anisidino)methyl]indole, the rearranged product is 3 - [(2-(*p*-methoxyphenylimino)-1-pyrrolindinyl)methyl]indole.

3,816,455

CERTAIN BENZOTHIEPINO-INDOLES AND INDOLINE-THIOCHROMANS

Vasken Paragamian, Dresher, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Original application Apr. 23, 1971, Ser. No. 137,043, now Patent No. 3,723,459. Divided and this application July 21, 1972, Ser. No. 274,001

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.28 7 Claims

6,7 - Dihydro - 12H[1]benzothiepino[5,4-b]indole-5-oxides are utilized as precursors for making certain 2-

oxospiro[indoline-3,4'-thiochroman] derivatives, of which the ester and nitrile derivatives are useful as inhibitors of gastric acid secretion and the acid derivatives are useful as precursors for making the ester derivatives.

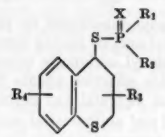
3,816,456

(DI)-THIOPHOSPHONIC ACID ESTERS, (DI)-THIOPHOSPHONIC AND -PHOSPHORIC ACID ESTER AMIDES

Gerhard Hörlein, Frankfurt am Main, Gerhard Salbeck, Kelkheim, Taunus, Ludwig Emmel, Bergen-Enkheim, and Werner Bonin, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 28, 1972, Ser. No. 293,132
Claims priority, application Germany, July 22, 1972, P 22 36 118.8
Int. Cl. C07d *65/08*
U.S. Cl. 260—327 TH 9 Claims

Compounds of the formula



I

where

R_1 is alkyl or alkoxy each having from 1 to 4 carbon atoms or phenyl;

R_2 is alkoxy having from 1 to 6 carbon atoms if R_1 is alkyl or phenyl, amino, alkylamino or dialkylamino each having from 1 to 6 carbon atoms, or alkenylamino having from 1 to 4 carbon atoms;

R_3 is hydrogen or alkyl having from 1 to 4 carbon atoms;

R_4 is hydrogen, alkyl having from 1 to 4 carbon atoms, or halogen;

X is oxygen or sulfur;

are useful pesticides in the agricultural and veterinary fields.

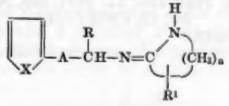
3,816,457

LACTAMIMIDE DERIVATIVES

J. Martin Grisar, George P. Claxton, and Thomas R. Blohm, Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Filed Jan. 5, 1973, Ser. No. 321,160
Int. Cl. A61k *27/00*; C07d *63/12*
U.S. Cl. 260—329 AM 9 Claims

Novel compounds useful as hypoglycemic agents are represented by the formula



wherein X represents oxygen or sulfur; A represents a bond, or a straight or branched alkylene chain of from 1 to 3 carbon atoms; R represents hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a straight or branched lower alkenyl group of from 3 to 6 carbon atoms, a cycloalkyl group of from 3 to 6 carbon atoms or phenyl; R^1 represents hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms; *n* is an integer of from 3 to 11; and pharmaceutically acceptable acid addition salts and individual optical isomers of the compounds where applicable.

3,816,458

3-SUBSTITUTED 6α,β-ALKYL-CYCLOPENTA[f][1]BENZOPYRANS AND -NAPHTHO[2,1-b]PYRANS

Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 679,989, Nov. 2, 1967, now Patent No. 3,544,598, which is a continuation-in-part of abandoned application Ser. No. 633,730, Apr. 26, 1967, which is a continuation-in-part of abandoned application Ser. No. 604,124, Dec. 23, 1966, which in turn is a continuation-in-part of abandoned application Ser. No. 549,816, May 13, 1966. This application also a continuation-in-part of abandoned application Ser. No. 813,693, Apr. 4, 1969. This application July 22, 1970, Ser. No. 57,372
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 52 Claims

Stereo-specific total synthesis of steroidal materials. 7-substituted 3-oxo-1-heptenes or variants thereof are reacted with 2-alkylcycloalkane-1,3-diones yielding 3-substituted 6α,β-alkyl-cyclopenta[f][1]benzopyrans or naphtho[2,1-b]pyrans. These are then subjected to a selective catalytic hydrogenation followed by an introduction of a hydroxy, alkoxy or acyloxy group at the 4a-position to produce a 3-substtiuted 6α,β,4a-hydroxy, alkoxy or acyloxy perhydrocyclopenta[f][1]benzopyran or perhydronaphtho[2,1-b]pyran. These latter compounds are then converted into 4- or 5-(3-oxoalkyl)perhydroindene-5-ones or perhydronaphthalene-6-ones which in turn can be converted to known steroidal materials by known methods.

3,816,459

SUBSTITUTED-DESA-PREGNANES AND DESA-PREGNENES

Milan Radoje Uskokovic, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application June 13, 1968, Ser. No. 736,587, now Patent No. 3,673,217, which is a division of application Ser. No. 499,094, Oct. 20, 1965, now Patent No. 3,574,761, dated Apr. 13, 1971, which is a continuation-in-part of application Ser. No. 400,206, Sept. 29, 1964, now Patent No. 3,412,107, dated Nov. 19, 1968. Divided and this application Oct. 5, 1971, Ser. No. 137,132
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 17 Claims

This invention is directed to substituted-desA-pregnanes and desA-pregnenes and derivatives thereof which are converted to known 9β,10α-steroids of the pregnane series. The latter compounds are useful as both progestational agents and as salt-retaining agents.

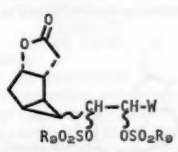
3,816,460

TRICYCLIC LACTONE BISALKANESULFONATES

Robert C. Kelly, Kalamazoo, Mich, assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Application Sept. 16, 1971, Ser. No. 181,246, now Patent No. 3,711,515, which is a continuation-in-part of application Ser. No. 93,483, Nov. 27, 1970, now abandoned. Divided and this application Dec. 15, 1972, Ser. No. 315,369
Int. Cl. C07d *5/32*
U.S. Cl. 260—343.3 7 Claims

Process for preparing tricyclic lactone bisalkanesulfonates of the formula

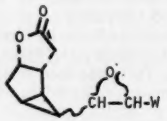


wherein R_9 is alkyl of 1 to 5 carbon atoms, inclusive, and W is 1-pentyl, cis 1-pent-2-enyl or 1-pent-2-ynyl. The

tricyclic lactone bisalkanesulfonates are useful intermediates in preparing prostaglandins having pharmacological utility.

3,816,461
TRICYCLIC LACTONE EPOXIDES
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Application Sept. 16, 1971, Ser. No. 181,246, now Patent No. 3,711,515, which is a continuation-in-part of application Ser. No. 93,483, Nov. 27, 1970, now abandoned. Divided and this application Dec. 15, 1972, Ser. No. 315,370
Int. Cl. C07d *5/32*
U.S. Cl. 260—343.3 **5 Claims**

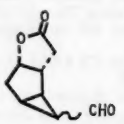
Process for preparing tricyclic lactone epoxides of the formula



wherein W is 1-pentyl, cis 1-pent-2-enyl or 1-pent-2-ynyl. The tricyclic lactone epoxides are useful intermediates in preparing prostaglandins having pharmacological utility.

3,816,462
TRICYCLIC LACTONE ALDEHYDE
Robert C. Kelly, Kalamazoo, Mich. assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Application Sept. 16, 1971, Ser. No. 181,246, now Patent No. 3,711,515, which is a continuation-in-part of abandoned application Ser. No. 93,483, Nov. 27, 1970. Divided and this application Dec. 15, 1972, Ser. No. 315,371
Int. Cl. C07d *5/32*
U.S. Cl. 260—343.3 **4 Claims**

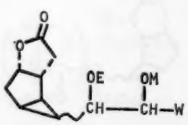
Process for preparing an optically active tricyclic lactone aldehyde of the formula



or the mirror image thereof, or a racemic compound of that formula and the mirror image thereof, wherein ~ indicates attachment of the moiety to the cyclopropane ring in exo or endo configuration. The tricyclic lactone aldehydes are useful intermediates in preparing prostaglandins having pharmacological utility.

3,816,463
TRICYCLIC GLYCOL
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Application Sept. 16, 1971, Ser. No. 181,246, now Patent No. 3,711,515, which is a continuation-in-part of abandoned application Ser. No. 93, 483, Nov. 27, 1970. Divided and this application Dec. 15, 1972, Ser. No. 315,372
Int. Cl. C07d *5/32*
U.S. Cl. 260—343.3 **9 Claims**

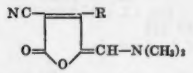
Process for preparing optically active tricyclic glycols of the formula



or the mirror image thereof, or a racemic compound of that formula and the mirror image thereof, wherein E and M are both hydrogen or wherein one of E and M is hydrogen and the other is formyl, wherein W is 1-phenyl, cis-1-pent-2-enyl or 1-pent-2-ynyl. The tricyclic glycols are useful intermediates in preparing prostaglandins having pharmacological utility.

3,816,464
PROCESS FOR PREPARING FURANONES
Dietrich Erdmann, Klemens Schuhrer, Wolfgang Koch, and Gerhart Schneider, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany
No Drawing. Filed Mar. 8, 1972, Ser. No. 232,974
Claims priority, application Germany, Apr. 3, 1971, P 21 16 416.9; Feb. 1, 1972, P 22 04 520.1
Int. Cl. C07d *5/06*
U.S. Cl. 260—343.6 **2 Claims**

The invention relates to furanones of the general formula



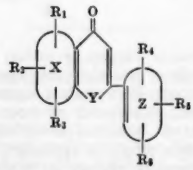
wherein R is phenyl substituted by phenyl, halogen, trifluoromethyl, alkyl and/or alkoxy containing up to 4 carbon atoms, or thienyl optionally substituted by chlorine, which are valuable effective agents for pest control exhibiting very good algicidal and herbicidal properties, as well as fungicidal and antibacterial activity. The invention further relates to intermediates for the preparation of said furanones, and to an improvement in the process for the production thereof.

3,816,465
PROCESS FOR PREPARING 2-SUBSTITUTED-3,4-DIHYDRO-2H-PYRANS
Yoshiharu Morita, Ryoji Kikumoto, Hiroshi Ohba, and Akio Nakamura, Yokohama, Kaoru Fukuda, Sagamihara, and Tatsuo Nomura, Yokohama, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan
No Drawing. Filed Dec. 29, 1971, Ser. No. 213,715
Int. Cl. C07d *7/10*
U.S. Cl. 260—345.1 **12 Claims**

2-substituted-3,4-dihydro-2H-pyrans are prepared by reacting an α,β-unsaturated carbonyl compound with a vinyl ether in the presence of a catalytic amount of a salt of zinc, aluminum, copper or chromium, preferably the halide or nitride salts, or zirconium oxyhalide, oxynitrate or oxyacetate, or tungstic acid.

3,816,466
FLAVANOID RING SYSTEMS
Max von Strandtmann, Rockaway Township, Marvin P. Cohen, New Milford, Sylvester Klutchko, Hackettstown, and John Shavel, Jr., Mendham, N.J. assignors to Warner-Lambert Company, Morris Plains, N.J.
No Drawing. Filed Dec. 22, 1971, Ser. No. 215,914
Int. Cl. C07d *7/34*
U.S. Cl. 260—345.2 **17 Claims**

The present invention is concerned with compound of type I

I 

wherein Y is O or S, X and Z are aromatic or heteroaromatic rings; R_1, R_2, R_3, R_4, R_5, R_6 are hydrogen, halogen, amino, nitro, hydroxy, alkyl, aryl and alkoxy.

These compounds are useful in alleviating allergic conditions such as asthma.

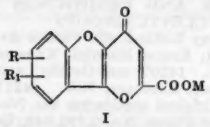
3,816,467

4 - OXO - 4H - PYRANO[3,2 - b]BENZOFURAN-2-CARBOXYLIC ACIDS AND SALTS THEREOF

John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 24, 1972, Ser. No. 299,952
Int. Cl. C07d 7/24
U.S. Cl. 260—345.7 19 Claims

This invention relates to novel compounds and pharmaceutical compositions containing said compounds of the formula:



I

wherein R and R_1 are each selected from the group consisting of hydrogen, chloro, fluoro, trifluoromethyl, lower-alkoxy and lower-alkyl and M is selected from the group consisting of hydrogen, sodium, potassium, calcium, magnesium, and aluminum and amine cations.

The compounds (I) above are formulated with pharmaceutical carriers for oral and parenteral administration, with insufflation being the preferred method. The compositions are useful in the prophylactic treatment of sensitized humans and mammals for allergic and all anaphylactic reactions of a reagin and non-reagin mediated nature.

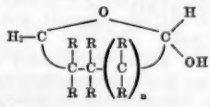
3,816,468

FLUORO-2-HYDROXYTETRAHYDROPYRANS

Samuel Gelfan, Niagara Falls, and Russell L. K. Carr, Grand Island, N.Y., and Charles F. Baranauckas, Edina, Minn., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation of application Ser. No. 867,060, Oct. 16, 1969, which is a continuation-in-part of Ser. No. 669,652, Sept. 21, 1967, which in turn is a continuation-in-part of Ser. No. 178,266, Mar. 8, 1962, all now abandoned. This application Sept. 28, 1971, Ser. No. 184,583
Int. Cl. C07d 7/04
U.S. Cl. 260—345.9 1 Claim

New compounds of the formula:



wherein *n* is from 0 to 1, and wherein the R's are selected from the group consisting of fluorine, perfluoroalkyl, perfluorocycloalkyl and perfluorophenyl, and may be the same or different. Also disclosed is a method for preparation of such compounds, which comprises reacting hydrogen with a precursor diacid halide. The compounds are useful as chemical intermediates and as additives to improve the clarity of plastics, such as polyvinyl chloride films.

3,816,469

INSECTICIDAL ESTERS OF CHRYSANTHEMIC ACID AND ALCOHOLS RELATED TO 3-HYDROXYMETHYLBENZOFURAN

Wayne I. Fanta, Colerain, Ohio, assignor to the Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 1, 1971, Ser. No. 120,043
Int. Cl. C07d 5/42
U.S. Cl. 260—346.2 R 8 Claims

Novel chrysanthemic acid (chrysanthemum carboxylic acid) esters of 3-hydroxymethylbenzofuran and the corresponding substituted benzofurans and insecticidal compositions containing same.

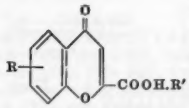
3,816,470

ORGANIC SALTS OF CHROMONE-CARBOXYLIC-2 ACIDS

Pierre A. Tronche, Clermont-Ferrand, Puy-de-Dome, France, assignor to Ferlux, Cournon d' Auvergne, France

No Drawing. Application Nov. 21, 1969, Ser. No. 878,896, which is a continuation-in-part of application Ser. No. 780,223, Nov. 29, 1968, now abandoned. Divided and this application May 24, 1972, Ser. No. 256,614
Claims priority, application France, Dec. 19, 1968, 179,086
Int. Cl. C07d 7/34
U.S. Cl. 260—345.2 4 Claims

Pharmaceutical compositions which comprise the organic salts and derivatives of chromone-carboxylic-2 acids having the following formula:



wherein R may be a hydrogen, a halogen or a hydroxyl or methoxy group and R' may be an organic base or more specifically a secondary amine.

3,816,471

SALTS OF ASPARTIC ANHYDRIDE WITH MONOESTERS OF SULFURIC ACID AND METHOD OF PREPARING THE SAME

Yasuo Ariyoshi, Kanagawa-ken, Yohko Koguchi, Tokyo, and Tetsuo Yamatani and Koji Toi, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed July 5, 1972, Ser. No. 269,043
Claims priority, application Japan, July 8, 1971, 46/50,556
Int. Cl. C07c 57/14
U.S. Cl. 260—346.8 9 Claims

Crystalline salts of aspartic anhydride with monoesters of sulfuric acid are prepared by reacting alcohols or phenols under anhydrous conditions with an intermediate mixed anhydride of aspartic, sulfuric and acetic acid obtained by reacting aspartic acid sulfate with acetic anhydride or by reacting aspartic acid with a mixture of acetic anhydride and sulfuric acid.

3,816,472

AZIDO ANALOGS OF GRISEOFULVIN

Elliot L. Shapiro and Ashit K. Ganguly, Cedar Grove, N.J., assignors to Schering Corporation, Bloomfield, N.J.

No Drawing. Filed July 6, 1972, Ser. No. 269,347
Int. Cl. C07d 5/36
U.S. Cl. 260—346.2 G 2 Claims

Disclosed herein are novel azido compounds, useful as antifungal agents.

3,816,473

SYNTHESIS OF 2,3-DIHYDRO-2,2-DIMETHYL-7-BENZOFURANYL N-METHYL-CARBAMATE

Alexander Serban, Doncaster, Victoria, and Phillip Knox Engel, Tullamarine, Victoria, Australia, assignors to ICI Australis Limited, Melbourne, Victoria, Australia

No Drawing. Filed Oct. 16, 1972, Ser. No. 297,724
Claims priority, application Australia, Nov. 8, 1971, 6,929/71
Int. Cl. C07d 5/10
U.S. Cl. 260—346.2 8 Claims

A process for the preparation of carbofuran which process comprises converting σ-isopropylphenol to 2,3-dihydro-2,2-dimethyl - 7 - isopropylbenzofuran (I); reacting (I) with an oxygen containing gas to form 2-(2,3-dihydro-2,2-dimethyl - 7 - benzofuranyl)-isopropyl hydroperoxide (II); catalytically decomposing (II) to form 2,3-dihydro-2,2-dimethyl - 7 - hydroxybenzofuran (III); reacting (III)

with methyl isocyanate to form 2,3-dihydro-2,2-dimethyl-7-benzofuranyl N-methylcarbamate (carbofuran) and recovering said carbamate. New compounds useful as intermediates in the above process are also described.

3,816,474

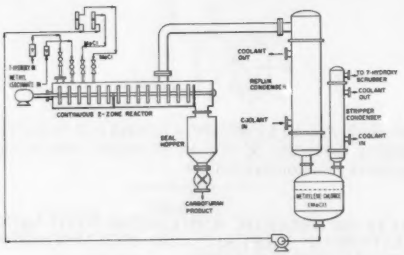
PROCESS FOR PRODUCTION OF CARBOFURAN

Dean F. Thorpe, Weston, Conn., assignor to FMC Corporation, New York, N.Y.

Continuation of abandoned application Ser. No. 846,069, July 30, 1969. This application June 5, 1972, Ser. No. 260,018

Int. Cl. C07d *5/36*

U.S. Cl. 260—346.2 R **5 Claims**



Production of solid addition products of the type $A+B=A.B+$heat, and specifically the production of 2,3-dihydro - 2,2 - dimethyl-7-benzofuranyl methylcarbamate (carbofuran) from 2,3-dihydro-7-hydroxy-2,2-dimethylbenzofuran (7-hydroxy) and methyl isocyanate, is described. In the process the raw materials are fed into a reaction zone capable of producing intensive mixing in the presence of a small quantity of a very volatile liquid which is non-reactive in the process, and has a high order of volatility, preferably as great as or not much lower than the methyl isocyanate—for example, methylene chloride. Once the exothermic reaction is initiated, cooling is effected by vaporization of the added liquid and unreacted isocyanate. The volatiles are condensed and returned to the process until the reaction is completed. Thereafter, the return of condensate is stopped so that in a very short time a dry powdered product is obtained. The process is characterized by very short processing times.

3,816,475

COLOR STABILIZER FOR MALEIC ANHYDRIDE

Jesse Wehrman, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 852,088, Aug. 21, 1969, now Patent No. 3,636,057. This application July 15, 1971, Ser. No. 163,040.

The portion of the term of the patent subsequent to Jan. 18, 1989, has been disclaimed

Int. Cl. C07c *57/14*

U.S. Cl. 260—346.8 **11 Claims**

High temperature color stable maleic anhydride can be obtained by adding trace amounts, i.e., 50–2000 p.p.m. of thiophosphorus compounds of the structure

where Q is X or RD, X is F, Cl, Br or I, D is O or S and R is hydrogen or any organic radical providing a compound soluble in maleic anhydride and having substantially no chromophoric properties and the acid salts thereof. For example, maleic anhydride containing 500 p.p.m. of thiophosphate trihalide maintained at 140° for 24 hours has a color of less than 50 (Hazen) whereas unstabilized maleic anhydride had a color of 300+ (Hazen).

3,816,476

ADDITION REACTION INVOLVING DIPEROXYFUMARATE AND COMPOUNDS HAVING DIPEROXYSUCCINYL GROUPS

Richard Anthony Bafford, 456 Forbes Ave., Tonawanda, N.Y. 14151; Ernest Rudolph Kamens, 52 Rano St., Buffalo, N.Y. 14207; and Orville Leonard Mageli, 81 Danbury Lane, Kenmore, N.Y. 14217,

No Drawing. Original application Ser. No. 711,502, Mar. 8, 1968, now Patent No. 3,592,948. Divided and this application Apr. 2, 1971, Ser. No. 134,098

Int. Cl. C07d *5/04*

U.S. Cl. 260—347.5 **14 Claims**

A diester of diperoxyfumaric acid is reacted at its double bond with an organic compound $R—(X)_s$ where "X" is a monovalent atom readily abstractable by a free radical, e.g., hydrogen, chlorine or bromine, and R is inert to the peroxycarbonyl groups of the diperoxyfumarate to form an addition product including at least one diester of a substituted diperoxysuccinic acid. For example: Tetrahydrofuran and di-t-butyl diperoxyfumarate react at about 0° C. to form di-t-butyl alpha-(2-tetrahydrofuryl) diperoxysuccinate. Polyglycols and polyvinyl ethers, alcohols, halides, etc. react to give polymers having pendant pairs of peroxycarbonyl ester groups in gamma relationship to each other.

These compounds are of especial interest in the preparation of block and graft copolymers.

3,816,477

MECHANICALLY STABLE HEAT RESISTANT EPOXY RESIN

Edward J. Traynor, Jr., Stoughton, Mass., and Lawrence D. Hofmeister, Santa Monica, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Continuation of abandoned application Ser. No. 847,739, Aug. 5, 1969. This application Apr. 24, 1972, Ser. No. 247,045

Int. Cl. C08g *30/00*

U.S. Cl. 260—348 **1 Claim**

A mechanically stable heat-resistant epoxy resin is made by reacting bis-(hydroxymethylphenyl)-ether with epichlorohydrin. This produces an epoxy-resin monomer or prepolymer that may be cured in accordance with practices usual in the art, yielding a cured resin that exhibits good mechanical stability and heat resistance.

3,816,478

PURIFICATION OF A MATERIAL CONTAINING ALDEHYDE IMPURITIES

Thomas A. Washall, North Hills, Del., and Walter A. Mameniskis, Drexel Hill, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

No Drawing. Continuation of abandoned application Ser. No. 56,723, July 20, 1970. This application Aug. 23, 1972, Ser. No. 283,125

Int. Cl. C07d *1/00*

U.S. Cl. 260—348 R **9 Claims**

Aldehyde impurities are effectively removed from organic liquids containing small amounts of water by passing same through a solid sodium bisulfite bed. The bed can be regenerated by heating to 75° C. to 120° C. As an example, propylene oxide containing 2000 p.p.m. acetaldehyde can be purified to an acetaldehyde content of less than 10 p.p.m.

3,816,479
PROCESS FOR THE PRODUCTION OF GLYCIDE
Axel Kleemann, and Gerd Schreyer, Grossauheim, and Otto Weiberg, Neu-Isenburg, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Filed Apr. 27, 1972, Ser. No. 248,047
Claims priority, application Germany, May 14, 1971, P 21 23 930.5
Int. Cl. C07d *1/18*
U.S. Cl. 260—348.5 L 10 Claims

Glycide is prepared by reacting allyl alcohol with a pure aqueous solution of a 2 to 5 carbon atom percarboxylic acid at a temperature of 0 to 45° C.

3,816,480
3-OXYGENATED 21-DIALKYLAMINO-20-METHYL-5α-PREGN-17(20)-DIEN-3-ONES AND CONGENERS
George R. Lenz, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed July 30, 1973, Ser. No. 383,526
Int. Cl. C07c *169/22*
U.S. Cl. 260—397.1 14 Claims

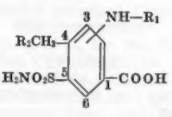
Preparation of 3-oxygenated 21-dialkylamino-20-methyl - 5α - pregn - 17(20) - dien-3-ones and congeners, and the valuable antibiotic properties thereof, are disclosed.

3,816,481
PROCESS FOR PREPARING 6-METHYLATED STEROIDS
George H. Douglas, Paoli, Pa., Warren R. Faust, Ann Arbor, Mich., and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Feb. 11, 1972, Ser. No. 225,676
Int. Cl. C07c *169/20, 169/08*
U.S. Cl. 260—397.4 2 Claims

A novel process for the synthesis of 6α-methylated steroids, particularly of the 17α-pregnane type. The final products have progestational activity.

3,816,482
SULFAMYLBENZOIC ACIDS
Peter Werner Feit, Gentofte, and Ole Bent Tvaermose Nielsen, Vanlose, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktieselskab Ballerup, Denmark
No Drawing. Original application June 16, 1971, Ser. No. 153,879, now Patent No. 3,758,522, dated Sept. 11, 1973. Divided and this application Sept. 13, 1972, Ser. No. 288,764
Int. Cl. C07c *143/78*
U.S. Cl. 260—397.7 R 6 Claims

The invention relates to a series of new compounds, their salts and esters and to methods for the preparation of the compounds having the general formula:



in which the NH—R_1 group can be in the 2- or 3-position, R_1 represents an aliphatic radical with from 3 to 8 carbon atoms in the chain, or a mononuclear aromatically or a mononuclear heterocyclically substituted methyl or ethyl group, and R_2 represents an unsubstituted or substituted phenyl group.

The compounds of the invention possess pronounced diuretic and saluretic activities.

3,816,483
CARBOXYLIC ACID AMIDE PREPARATION
Achim Werdehausen, Monheim, Herbert Weiss, Cologne-Deutz, and Hartwig Schutt, Dusseldorf-Benrath, Germany, assignors to Henkel & Cie, GmbH, Dusseldorf, Germany
No Drawing. Filed May 24, 1971, Ser. No. 146,300
Claims priority, application Germany, June 2, 1970, P 20 26 832.0
Int. Cl. C07c *103/30*
U.S. Cl. 260—404 10 Claims

An improved method for production of carboxylic acid amides comprising reacting ammonia and carboxylic acids of 8 to 24 carbon atoms or an ester thereof in the presence of a reaction-soluble catalyst of a metal from group IV*b* and V*b* of the Periodic Table.

3,816,484
ALIPHATIC HYDROCARBON 2,4-DIENAMIDES
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.
No Drawing. Continuation-in-part of application Ser. No. 187,898, Oct. 8, 1971, now Patent No. 3,752,843, which is a continuation-in-part of abandoned application Ser. No. 111,767, Feb. 1, 1971. This application Nov. 22, 1971, Ser. No. 201,162
Int. Cl. C07c *103/56;* A01n *9/20*
U.S. Cl. 260—404 18 Claims

Novel aliphatic hydrocarbon 2,4-diene amides, intermediates therefor, synthesis thereof, and their use for the control of insects.

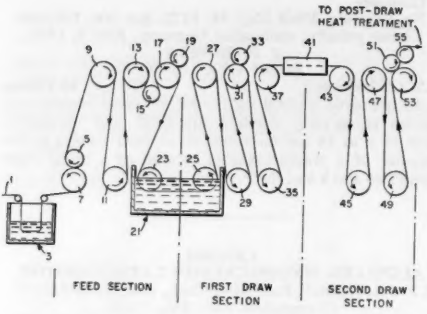
3,816,485
METHOD OF SYNTHESIZING FATTY ACID ESTERS
Joseph R. Wechsler, Chicago, Ill., assignor to Stepan Chemical Company, Northfield, Ill.
No Drawing. Continuation-in-part of abandoned application Ser. No. 655,590, July 24, 1967. This application Nov. 13, 1970, Ser. No. 89,491
Int. Cl. C07c *51/22, 67/02*
U.S. Cl. 260—410.9 R 16 Claims

A process of manufacturing synthetic fatty acid C_1–C_6 esters from straight-chain hydrocarbons by catalytic oxidation wherein a reaction cycle is employed that reduces over-oxidation and molecular degradation so as to provide higher yields and reduce impurities. Relatively pure fatty acid esters are recovered from the crude oxidation products by a plurality of alternative purification methods utilizing saponification, hydrogenation, polyol esterification processes as well as extraction processes to reduce the contaminants in the ultimate product so as to yield substantially pure products.

3,816,486
TWO STAGE DRAWN AND RELAXED STAPLE FIBER
Oakley R. Vail, Kinston, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of abandoned application Ser. No. 880,132, Nov. 26, 1969. This application Nov. 25, 1970, Ser. No. 92,776
Int. Cl. B29c *17/02;* C08g *17/00*
U.S. Cl. 260—75 R 9 Claims

A process for drawing polyester filaments that includes the steps of drawing the filaments in a first zone at a temperature between 10° C. and 50° C. followed by further drawing the filaments in a second zone at a temperature above 70° C. but below the melting point of the polyester. When the polyester is polyethylene terephthalate, it is preferred that the filaments be drawn at least about 2.6 times their original length at a temperature between 25° C. and

45° C. in the first draw zone and then further drawn in the second draw zone at a temperature of from about 70° C. to about 150° C. to provide a total draw ratio of at



least about 2.8:1. The fibers produced have a tenacity at 7 percent elongation of less than 2.0 grams per denier, a low shrinking force and when blended with cotton provide a blend yarn having a high Lea Product.

3,816,487

PROCESS FOR OBTAINING WOOL FAT BY WASHING RAW WOOL WITH REACTIVE SURFACE-ACTIVE AGENTS

Luzius Schibler, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 96,675, Dec. 9, 1970, which is a continuation-in-part of application Ser. No. 837,901, June 30, 1969, and a continuation-in-part of application Ser. No. 206,184, Dec. 8, 1971, which in turn is a continuation of application Ser. No. 38,507, May 18, 1970, all now abandoned. This application June 8, 1972, Ser. No. 260,876

Int. Cl. C11b *1/10*

U.S. Cl. 260—412.8 **14 Claims**

A process for washing raw wool is provided which also comprises obtaining the wool fat contained therein as well as clarifying the wash water which results. The wool is first washed in an aqueous solution containing a reactive tenside; this tenside is then crosslinked and the wool fat together with the emulsified constituents are separated out from the clarified waste water. The wool fat is then extracted from the phase which has been separated off with an organic solvent.

3,816,488

INCREASING THE SELECTIVITY AND YIELD IN THE PRODUCTION OF CARBOXYLIC ACIDS

John H. Craddock, Ballwin, Arnold Hershman and Frank E. Paulik, St. Louis, and James F. Roth, Maryland Heights, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 752,746, Aug. 15, 1968. This application July 1, 1970, Ser. No. 51,696

The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed

Int. Cl. C07c *51/14*

U.S. Cl. 260—413 **11 Claims**

The present invention relates to an improved process for the production of carboxylic acids, specifically by the reaction of ethylenically unsaturated compounds with carbon monoxide and water, in the presence of catalyst compositions essentially comprising rhodium compounds and complexes, together with an iodide promoter in critical proportions. The process is particularly useful for production of terminal carboxylic acids.

3,816,489

INCREASING THE SELECTIVITY AND YIELD IN THE PRODUCTION OF CARBOXYLIC ACIDS

John H. Craddock, Ballwin, Arnold Hershman and Frank E. Paulik, St. Louis, and James F. Roth, Maryland Heights, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 752,795, Aug. 15, 1968. This application July 1, 1970, Ser. No. 51,700

The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed

Int. Cl. C07c *51/14*

U.S. Cl. 260—413 **11 Claims**

The present invention relates to an improved process for the production of carboxylic acids, specifically by the reaction of ethylenically unsaturated compounds with carbon monoxide and water, in the presence of catalyst compositions essentially comprising iridium compounds and complexes, together with an iodide promoter in critical proportions. The process is particularly useful for the production of terminal carboxylic acids.

3,816,490

PRODUCTION OF CARBOXYLIC ACIDS

Denis Forster, University City, and Donald E. Morris, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 27, 1971, Ser. No. 212,680

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 **13 Claims**

Production of carboxylic acids and carboxylic acid anhydrides by carboxylation of ethylenically-unsaturated compounds utilizing a catalyst system comprising a Group VIII metal compound and a promoter selected from the group consisting of phenol, substituted phenols, thiophenol, substituted thiophenols, fluorine-substituted carboxylic acids, thiocarboxylic acids and sulphonic acids.

3,816,491

HEXAMETHYLTUNGSTEN

Geoffrey Wilkinson, London, England, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 2, 1973, Ser. No. 329,153

Int. Cl. C07f *11/00*

U.S. Cl. 260—429 R **3 Claims**

Hexamethyltungsten is a red crystalline solid which is extremely volatile. In the absence of air at about 50° C. it decomposes rapidly to yield metallic tungsten. It is therefore useful as a metallizing agent for materials which are sensitive to higher and more conventional metallizing temperatures.

3,816,492

NICKEL CYCLOHEXYLAMINE COMPLEXES OF 2,2' - THIOBIS(p - ALKYLPHENOL) AND USE IN POLYOLEFINS

Joseph Anthony Stretanski, Clinton, and Joseph Adrian Hoffman, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 3, 1972, Ser. No. 240,764

Int. Cl. C07f *15/04*

U.S. Cl. 260—439 R **2 Claims**

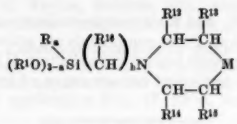
Nickel cyclohexylamine complexes of 2,2'-thiobis(p-alkylphenol) are new compounds, useful as ultraviolet light stabilizers and dye receptors for polyolefins.

3,816,493
PROCESS FOR PREPARING ORGANOPOLYSILOXANE OILS
Siegfried Nitzsche, Rudolf Strasser, and Robert Leser, Burghausen, and Helmut Spork, Altotting, Germany, assignors to Wacker Chemie GmbH, Munich, Germany
No Drawing. Filed June 23, 1971, Ser. No. 156,108
Claims priority, application Germany, June 23, 1970, P 20 30 936.8
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 E 8 Claims

An improved process for equilibrating organopolysiloxanes which comprises passing an inert gas through a catalytic bed which is in contact with the organosiloxanes.

3,816,494
AMINO-FUNCTIONAL SILICONE COMPOUNDS
Abe Berger, 1504 Barclay Place, Schenectady, N.Y. 12309
No Drawing. Original application Aug. 23, 1971, Ser. No. 174,165, now abandoned. Divided and this application Jan. 18, 1973, Ser. No. 324,989
Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.8 R 2 Claims

A novel class of silicone compounds of the formula,



wherein R, R^1, R^{16}, R^{12}, R^{13}, R^{14} and R^{15} are selected from hydrogen and hydrocarbon radicals, while M is selected from sulfone and ketone groups, h is a whole number that varies from 2 to 20 and a is a whole number that varies from 0 to 2. This novel class of compounds are useful as flocculents for colloidal organic matter, as ingredients for detergent resistant polishes and as bonding agents for bonding various plastic resins and rubber to glass fibers and other types of glass material.

3,816,495
POLYFLUORINATED POLY(VINYL ISOCYANATES)
William J. Middleton, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Aug. 31, 1971, Ser. No. 176,709
Int. Cl. C07c 119/04
U.S. Cl. 260—453 AL 7 Claims

Disclosed herein are polyhalogenated isocyanates (intermediates for polyfluorinated vinyl isocyanates); polyfluorinated vinyl isocyanates, process therefor, and homopolymers and copolymers thereof; and use of said polyfluorinated vinyl isocyanate homopolymers and copolymers as water and oil repelling agents for cloth and paper.

3,816,496
SOLVENT EXTRACTION AND DISTILLATION TECHNIQUE FOR PURIFICATION OF ORGANIC ISOCYANATES
Wilhelm J. Schnabel, Branford, Conn., assignor to Olin Corporation
Filed Jan. 3, 1972, Ser. No. 214,769
Int. Cl. C07c 119/04
U.S. Cl. 260—453 SP 7 Claims

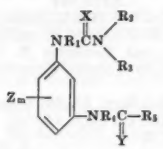
Alkyl substituted benzene is used as a solvent to extract organic isocyanates from crude reaction mixtures containing organic isocyanates. The crude reaction mixture is admixed with the alkyl substituted benzene solvent and heated to a temperature in the range from 100° C. to about 280° C. for a solvent extraction period ranging from 0.5 to about 24 hours. The alkyl substituents on the benzene contain between 1 and 12 carbon atoms and sufficient substituents to provide at least two carbon atoms in the substituent.

3,816,497
PRODUCTION OF β-HALOALKYL THIOCYANATES
Richard Parke Welcher, Old Greenwich, Conn., assignor to American Cyanamide Company, Stamford, Conn.
No Drawing. Filed Jan. 3, 1972, Ser. No. 215,206
The portion of the term of the patent subsequent to Feb. 22, 1989, has been disclaimed
Int. Cl. C07c 161/02
U.S. Cl. 260—454 5 Claims

There is provided a process for preparing a β-haloalkyl thiocyanate by initially reacting a halogen and a water-soluble thiocyanate salt at a temperature between 0° C. and 10° C. in the presence of a 2-phase solvent mixture consisting of substantially instantaneously formed thiocyanogen halide in the organic solvent phase containing traces of water and instantaneously formed alkali halide salt in the aqueous phase, separating and substantially removing the aqueous phase, reacting at temperatures ranging from about room temperature to not more than 90° C. the so-formed thiocyanogen halide in the said organic solvent medium with a substituted or unsubstituted ethylene or substituted or unsubstituted acetylene or equivalents thereof in the presence or absence of a free radical catalyst or actinic light, and recovering so-formed β-haloalkyl thiocyanate.

3,816,498
META-ANILIDE UREA COMPOSITIONS AND THEIR UTILITY AS HERBICIDES
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Application Mar. 26, 1970, Ser. No. 23,021, now Patent No. 3,642,891, which is a continuation-in-part of application Ser. No. 746,007, July 19, 1968, which in turn is a continuation-in-part of application Ser. No. 662,573, Aug. 23, 1967, both now abandoned. Divided and this application Sept. 13, 1971, Ser. No. 180,171
Int. Cl. C07c 119/20
U.S. Cl. 260—453 R 6 Claims

Meta-anilide urea compositions have the formula:



in which X and Y are, independently, oxygen and sulfur; R_1 is hydrogen or lower alkyl; R_2 and R_3 are, independently, hydrogen, alkyl, lower alkoxy, haloalkyl, lower alkenyl, cycloalkyl having from 3 to 6 carbon atoms, inclusive, carbalkoxyalkyl, furfuryl, naphthyl, phenyl or substituted-phenyl, inclusive, in which the substituents are halogen, nitro, or lower alkoxy; R_4 is hydrogen or lower alkyl; R_5 is hydrogen, alkyl, ethyl cycloalkyl, lower alkenyl, halogenated lower alkyl, cycloalky having 3 to 6 carbon atoms, inclusive, pinonoyl 2,4-dichlorophenoxymethylene, benzyl, phenyl, or substituted-phenyl in which the substituents are halogen, nitro, lower alkyl, lower alkoxy or trihalomethyl; Z is halogen, lower alkyl, nitro, amino or trifluoromethyl, and m is an integer having a value from 0 to 4, inclusive, provided that when R_1, R_2, R_3 and R_4 are each hydrogen, X and Y are each oxygen and m is O, then R_5 is other than methyl or ethyl. The compounds are useful as herbicides and they exhibit both pre-emergence and post-emergence activity. Representative compounds are:

1-(3′-isobutyramidophenyl)-3-methyl urea,
1-cyclohexyl-3-(3′-propionamidophenyl)urea,
1-butyl-3-(3′-propionamidophenyl)urea,
1-butyl-3-(3′-isobutyramidophenyl)urea,
1-(3′-nitrophenyl)-3-(3′-isobutyramidophenyl)urea,

1-N,N-dimethyl-3-(pivalamidophenyl)urea,
1-(3'-propionamidophenyl)-3-n-butyl thiourea, and
1-(3'-pestafluoropropionamido phenyl)3,3-dimethyl urea.

3,816,499
MANUFACTURE OF ISOCYANATES

Geoffrey Ernest Beswick and Robert Joseph Lindsay, Blackley, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Sept. 11, 1972, Ser. No. 287,698
Claims priority, application Great Britain, Sept. 22, 1971, 44,201/71
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 P **8 Claims**

A process for the manufacture of α-isocyanatoalkyl benzenoid compounds containing one or more α-isocyanatoalkyl groups which comprises reacting an α-haloalkyl benzenoid compound with a cyanate of an alkali metal, an ammonium radical or an alkaline earth metal in a ketonic or aldehyde solvent of the formula R^1COR^2 where R^1 represents methyl or hydrogen and R^2 represents an aryl radical or an alkyl radical containing up to 3 carbon atoms in the presence of phosphorus pentoxide and a weakly basic organic tertiary nitrogen compound.

3,816,500
2-CHLOROBENZYL N,N-DIETHYLTHIO-CARBAMATE

Ichiro Kimura and Yoshiro Takahashi, Shizuoka, and Hideo Ito, Shimizu, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Chiyoda-ku, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 162,259, July 13, 1971, now Patent No. 3,746,532. This application Nov. 3, 1971, Ser. No. 195,490
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A **1 Claim**

2-chlorobenzyl N,N - diethylthiocarbamate has been found to possess excellent herbicidal properties and high toxicity toward sea-organisms.

3,816,501
CYCLOPROPANEMETHYLTHIOL DIESTER OF TEREPHTHALIC ACID

Clive A. Henrick and Gerardus B. Staal, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Sept. 18, 1972, Ser. No. 289,897
Int. Cl. C07c *153/07*
U.S. Cl. 260—455 R **1 Claim**

The compound

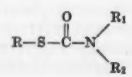
synthesis thereof, and compositions thereof, for the control of mites.

3,816,502
INSECTICIDAL ACTIVE GERANYL AND CITRONYL AMINE DERIVATIVES AND THEIR EPOXIDES

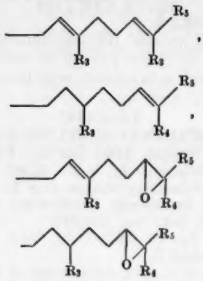
Ferenc M. Pallos, Walnut Creek, and Julius J. Menn, Saratoga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Aug. 16, 1971, Ser. No. 172,202, now abandoned. Divided and this application Apr. 30, 1973, Ser. No. 355,601
Int. Cl. C07c *154/00*
U.S. Cl. 260—455 A **39 Claims**

Compounds having the formula



wherein R can be selected from the group consisting of alkyl, alkenyl, alkynyl, alicyclic, ketoalkyl, alkoxyalkyl, alkylthioalkyl, carbalkoxy, carboxamido, dialkylaminoalkyl, cyanoalkyl, haloalkyl, aryl, aralkyl, and substituted aryl and aralkyl, wherein said substituents can be selected from halogen, alkyl, alkoxy and alkylthio; R_1 can be selected from hydrogen, alkyl, alkoxyalkyl, alkylthioalkyl, cyanoalkyl, alkenyl and alkynyl; R_2 can be selected from the group consisting of



and

wherein R_3, R_4 and R_5 are independently selected from methyl and ethyl. These compounds are active in blocking normal development and/or reproduction of insect species which can be applied at certain stages of insect development.

3,816,503
PROCESS FOR PREPARING CYANOETHYLATED KETONES

Edward van Poelvoorde, Beek, Limburg, and Hendrikus van der Zalm, Geleen, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Filed Sept. 19, 1972, Ser. No. 290,360
Claims priority, application Netherlands, Sept. 29, 1971, 7113332
Int. Cl. C07c *121/02, 121/16, 121/46*
U.S. Cl. 260—464 **7 Claims**

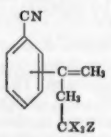
(2-cyanoethyl)-ketones are prepared by liquid phase reaction of acrylonitrile and a ketone without the undesirable formation of polymer-like materials by maintaining the amount of oxygen in the liquid reaction mixture below about 20 p.p.m. according to the process disclosed. An inert gas is bubbled into the reaction area and optionally into one or both of the reactants prior to introduction into the reaction area.

3,816,504
(POLYHALOALKYL)-VINYLBENZONITRILE COMPOUNDS

Leo R. Morris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,759
Int. Cl. A01n *9/20;* **C07c** *121/52*
U.S. Cl. 260—465 G **4 Claims**

Compounds of the formula



wherein X is Br or Cl and Z is H, X or alkyl of one to four carbon atoms, which compounds when pure are viscous liquids and are useful as herbicides.

3,816,505

PREPARATION OF HALOGENATED DICYANOBENZENES

Lewis William Watts, Jr., Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Continuation-in-part of abandoned application Ser. No. 38,574, May 18, 1970. This application Oct. 19, 1972, Ser. No. 299,163

Int. Cl. C07c *121/54, 121/56, 121/58*
U.S. Cl. 260—454 G 4 Claims

A process for preparing halogenated derivatives of dicyanobenzenes by a direct vapor phase reaction of a halogen and a dicyanobenzene in an open tube. Halogenated dicyanobenzenes are reported in Horst Scheuermann's U.S. Pat. 3,290,353 (1966) and Robert D. Battershell's U.S. Pat. 3,331,735 (1967) to be useful as fungicides, bactericides and nematocides.

3,816,506

AMMOXIDATION OF SATURATED HYDROCARBONS

Keith M. Taylor, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 787,572, Dec. 27, 1968, which is a continuation-in-part of abandoned application Ser. No. 788,083, Dec. 30, 1968. This application Dec. 17, 1970, Ser. No. 99,299

Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 3 Claims

Acrylonitrile or methacrylonitrile are prepared in a vapor phase process which comprises reacting propane or isobutane, ammonia and oxygen in the presence of a catalyst consisting essentially of, as the essential catalytic ingredients, antimony and uranium and optionally a third element selected from the group consisting of nickel, vanadium and mixtures thereof, said elements being present in the form of oxides or of a complex with oxygen or mixtures thereof.

3,816,507

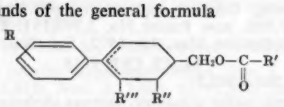
DERIVATIVES OF THE 2 - (LOWER ALKYL)-3-(LOWER ALKYL) - 4 - ARYL - 3 - OR 4-CYCLOHEXENECARBINOLS

George Karmas, Bound Brook, N.J., assignor to Ortho Pharmaceutical Corporation

No Drawing. Original application May 14, 1968, Ser. No. 728,900, now Patent No. 3,557,129. Divided and this application Sept. 14, 1970, Ser. No. 72,218

Int. Cl. C07c *69/74*
U.S. Cl. 260—468 R 7 Claims

Compounds of the general formula



are disclosed wherein —R is selected from the group consisting of hydrogen, hydroxy, lower alkoxy of up to 8 carbon atoms, lower alkyl of up to 8 carbon atoms, and lower alkyl anilino of up to 4 carbon atoms; —R′ is selected from the group consisting of alkyl and alkenyl of up to 20 carbon atoms, cycloalkyl lower alkyl of up to 3 carbon atoms in the alkyl portion, adamantyl, pyridyl, furyl, lower alkyl carboxylic acids and their alkali metal salts, esters and carbamates; and R″ and R‴ are selected from the group consisting of lower alkyl of up to 3 carbon atoms. These compounds exhibit estrogenic properties and when given in a single subcutaneous dose have long acting effects in the suppression of animal reproduction.

3,816,508

PROSTAGLANDIN F_1 ANALOGS

George E. Just, 499 Mount Pleasant Ave., Westmount, Quebec, Canada, and Chaim Simonovitch, Rishon-le-Zion, Israel; said Simonovitch assignor to said Just

No Drawing. Continuation of application Ser. No. 103,314, Dec. 31, 1970, which is a continuation-in-part of application Ser. No. 657,085, July 31, 1967, both now abandoned. This application Aug. 17, 1972, Ser. No. 281,338

Claims priority, application Great Britain, Aug. 9, 1966, 35,550/66; Jan. 24, 1967, 3,588/67

Int. Cl. C07c *61/32, 69/74*
U.S. Cl. 260—468 D 14 Claims

Prostaglandin $F_{1\alpha}$, prostaglandin $F_{1\beta}$, and analogs of those are produced from bicyclo[3.1.0]hexane intermediates.

3,816,509

ESTERS OF 3-PHENYLADAMANTANE-1-CARBOXYLIC ACID

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 838,644, July 2, 1969, now Patent No. 3,663,565. This application Dec. 2, 1971, Ser. No. 204,311

Int. Cl. C07c *93/20*
U.S. Cl. 260—469 3 Claims

Dialkylaminoalkyl amides, esters, thioamides, and thioesters of 3-phenyladamantane - 1 - carboxylic acid are described herein. They possess anti-bacterial, antiprotozoal, anthelmintic, anti-fungal, anti-algal, and anti-viral activity. The compounds are prepared from 3-phenyladamantane-1-carboxylic acid or the corresponding acid chloride.

3,816,510

PROCESS FOR PREPARING UNSYMMETRICALLY SUBSTITUTED DIBASIC ACIDS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,721

Int. Cl. C07c *101/18*
U.S. Cl. 260—482 R 8 Claims

Substituted dibasic acids, and particularly unsymmetrically substituted dibasic acids, are prepared by treating a dibasic acid imide with an acide anhydride followed by treatment with an alcohol. The products thus produced comprise compounds containing an ester at one end and an amide or *N*-substituted amide at the other end.

3,816,511

METHOD FOR PREPARING POLYESTERS BY THE POLYMERIZATION OF EPSILON CAPROLACTONES

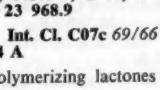
Christian Burba, Luenen, and Eugen Griebsch, Unna, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

No Drawing. Filed Sept. 7, 1971, Ser. No. 178,399

Claims priority, application Germany, Feb. 26, 1970, P 20 09 885.5; Nov. 7, 1970, P 20 54 903.5; May 14, 1971, P 21 23 968.9

Int. Cl. C07c *69/66*
U.S. Cl. 260—484 A 16 Claims

Methods for polymerizing lactones of the formula



wherein R is hydrogen, methyl, or ethyl, in the presence of antimony (V) fluoride, antimony (V) chloride, or a trialkyl oxonium salt as a catalyst; and in the further presence of a non-basic organic compound (optional when a trialkyl oxonium salt is employed) having active hydrogen atoms, such as a hydroxy compound, functioning to open the lactone ring.

3,816,512

TELOMER FROM ALKYL ACRYLATE OR METHACRYLATE AND SULFURYL HALIDE

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed July 5, 1972, Ser. No. 269,008

Int. Cl. C07c *69/34*

U.S. Cl. 260—485 H **11 Claims**

A novel alkylacrylate or methacrylate telomer is formed by telomerizing an alkyl acrylate or methacrylate with a sulfuryl halide. For example, methyl acrylate is reacted with sulfuryl chloride to form α,ω-dichloropoly-(methoxycarbonyl)alkane telomers. The telomers formed are employed to extract a halogenated hydrocarbon compound from a mixture comprising a halogenated hydrocarbon compound plus an alkane. The telomer is also employed to extract an aromatic hydrocarbon from a mixture comprising an aromatic hydrocarbon plus an alkane and/or alkene.

3,816,513

PROCESS FOR PRODUCING METHYL FORMATE

Hachiro Wakamatsu, Tokyo, and Koichi Shimomura, Yokohama, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sept. 9, 1971, Ser. No. 178,933

Int. Cl. C07c *67/00*

U.S. Cl. 260—488 K **7 Claims**

Carbon monoxide and methanol are reacted in gaseous or liquid phase to methyl formate at elevated pressure in the presence of an alkaline catalyst and of sufficient hydrogen to permit the unreacted carbon monoxide in the reaction mixture to be converted to methanol, the methanol being recycled to the methyl formate synthesis in continuous operation.

3,816,514

ESTERS OF PHENYL ETHERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Original application Dec. 31, 1970, Ser. No. 103,278, now Patent No. 3,709,915. Divided and this application Mar. 6, 1972, Ser. No. 232,307

Int. Cl. C07c *69/14, 69/24, 69/62*

U.S. Cl. 260—488 **20 Claims**

Esters of phenyl ethers and phenyl thioethers useful for the control of insects.

3,816,515

INJECTION METHOD

Michael Geoffrey Kelham, Stockton-on-Tees, England, assignor to, Imperial Chemical Industries Limited, London, England

Filed Nov. 17, 1969, Ser. No. 877,226

Claims priority, application Great Britain, Nov. 19, 1968, 54,798/68

Int. Cl. F23j *7/00*

U.S. Cl. 260—497 A **7 Claims**

A fluid is injected into another fluid in the shape of a diverging cone so that co-current streamlined flow is induced in the other fluid adjacent to the cone. An apparatus which achieves this flow pattern comprises a venturi nozzle in which there is no extraneous fluid inlet in the immediate region of the venturi nozzle. The invention is of particular use in the injection of a gas into a liquid when bubbles of uniform size are produced avoiding large bubbles which escape the liquid and small bubbles which tend to give rise to stable and undesirable foams. Another use of the invention is in flare stack construction in which the noise of the steam injectors is reduced because of reduced turbulence.

3,816,516

PHENYL-ALKANOLAMINE, ALKYLAMINE AND α-AMINOALKYL KETONE DERIVATIVES AS HEART STIMULANTS

David A. Cox, Canterbury, Ian T. Barnish, Ramsgate, and Anthony G. Evans, Westgate-on-Sea, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed July 7, 1971, Ser. No. 160,529

Claims priority, application Great Britain, July 18, 1970, 34,931/70

Int. Cl. C07c *127/16*

U.S. Cl. 260—501.17 **1 Claim**

Novel substituted 1-phenyl-2-alkylamino-alkanols, 1-phenyl-2-alkylamino-alkanes and α-aminoalkyl phenyl ketones useful as heart stimulants are disclosed.

3,816,517

PROCESS OF PRODUCING AMINO METHYLENE PHOSPHONIC ACIDS

Friedrich Krueger, Edingen, Lieselotte Bauer, Bad Durkheim, and Walter Michel, Ilvesheim, Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhein, Germany

No Drawing. Filed Mar. 18, 1971, Ser. No. 125,857

Claims priority, application Germany, Mar. 20, 1970, P 20 13 371.5

Int. Cl. C07c *9/38*

U.S. Cl. 260—502.5 **3 Claims**

Substantially pure amino methylene phosphonic acids, such as ethylene diamine tetra-(methylene phosphonic acid), nitrilo tris-(methylene phosphonic acid), and others are obtained in a high yield by reacting α-amino mono- or polycarboxylic acids which are substituted at their amino nitrogen atom, or their alkali metal salts with phosphorous acid and/or a phosphorus trihalogenide, preferably phosphorus trichloride in the presence or absence of an inert diluent.

3,816,518

PREPARATION OF ETHANE DIPHOSPHONIC ACIDS SUBSTITUTED WITH BOTH AMINE AND HYDROXY GROUPS

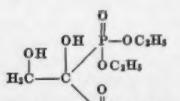
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application April 13, 1970, Ser. No. 27,988, now Patent No. 3,705,191. Divided and this application Mar. 13, 1972, Ser. No. 234,328

Int. Cl. C07f *9/38*

U.S. Cl. 260—502.5 **1 Claim**

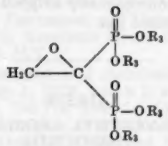
New and useful substituted ethane diphosphonic acids and salts and esters thereof as exemplified by the ester compound having the formula



tetraethyl, 1,2-dihydroxy ethane-1,1-diphosphonate and processes for preparing the same which generically com-

prises the "de-oxiranization" of an epoxy ethane diphosphonate having the formula

(II)



wherein R_3 is hydrogen, a metal ion, or an organic radical.

3,816,519

BIS(HALOALKYL)PYROPHOSPHONIC ACID AMINE SALTS

Walter V. Breitigam, Wood River, and Hans Low, East Alton, Ill., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Original application Nov. 18, 1968, Ser. No. 776,776. Divided and this application Mar. 31, 1971, Ser. No. 129,958

Int. Cl. C07f *9/36*

U.S. Cl. 260—502.21 **2 Claims**

Novel pyrophosphonic and pyrophosphinic acid derivatives and their amine salts are useful as lubricating oil additives.

3,816,520

PROCESS FOR PRODUCING AROMATIC SULFONATES

Charles V. Juelke, and Norman K. Cook, Morristown, N.J., said Juelke assignor to Celanese Corporation, New York, N.Y., and said Cook assignor to Fiber Industries, Inc.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,034

Int. Cl. C07c *143/42*; C08g *17/00*

U.S. Cl. 260—512 R **1 Claim**

Hydroxy-containing aromatic sulfonates, useful as comonomers for imparting basic dyeability to polyesters, are produced by the reaction of a glycidyl ester of a carboxylic acid with a metallized salt of a hydroxy-containing aromatic sulfonic acid in the presence of a basic catalyst. The reaction is carried out in a solvent, and at temperatures greater than about 45° C.

3,816,521

PROCESS FOR THE PRODUCTION OF p-HYDROXY BENZOIC ACID

Ryuzo Ueno, Nishinomiya-shi, and Tetsuya Niyazaki, Itami-shi, Japan, assignors to Ueno Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 25, 1968, Ser. No. 715,881

Claims priority, application Japan, Oct. 2, 1967, 42/63,018; Nov. 8, 1967, 42/71,391; Jan. 17, 1968, 43/2,151; Jan. 18, 1968, 43/2,342; Feb. 5, 1968, 43/6,688

Int. Cl. C07c *65/04*

U.S. Cl. 260—521 R **13 Claims**

A process for the production of p-hydroxy benzoic acid which comprises suspending a reactant selected from the group consisting of potassium phenoxide and mixtures of potassium phenoxide with phenol, in a liquid hydrocarbon boiling at 180°–350° C. selected from the group consisting of kerosene, light oil and mixtures thereof, and contacting the suspension with carbon dioxide of a pressure not exceeding 30 kg./cm.², at a temperature not lower than 180° C.

3,816,522

CATALYTIC OXIDATION OF CARBONYL COMPOUNDS

Theodore P. Goldstein, Yardley, Pa., assignor to Mobil Oil Corporation

No Drawing. Filed Oct. 5, 1971, Ser. No. 186,819

Int. Cl. C07c *63/02*

U.S. Cl. 260—523 A **14 Claims**

Carbonyl compounds, including aldehydes, may be oxidized under mild reaction conditions to the corresponding carboxy compound by carrying out the reaction in the presence of a thiazolium compound or cyanide ions as catalyst for the oxidation. The reaction mixtures produced by the method of this invention are of utility.

3,816,523

PROCESS FOR THE PRODUCTION AND PURIFICATION OF BENZOIC ACID

Henri Sidi, Paramus, and Michael Sidey, Garfield, N.J., assignors to Tenneco Chemicals, Inc.

Filed Oct. 11, 1968, Ser. No. 766,835

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R **9 Claims**

Products containing at least 99.8% of benzoic and little or no high boiling impurities are obtained by a process in which toluene is oxidized until about 25% to 45% of it is converted to benzoic acid, the benzoic acid is crystallized from the reaction mixture, and after washing with toluene the crystalline benzoic acid is distilled. From 10% to 100% of the combined mother liquor and toluene washes is purified by distillation before being recycled.

3,816,524

EXTRACTION OF CARBOXYLIC ACIDS FROM DILUTE AQUEOUS SOLUTIONS

Robert R. Grinstead, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 31, 1972, Ser. No. 285,546

Int. Cl. C07c *51/48*

U.S. Cl. 260—527 R **3 Claims**

Mono or dicarboxylic acids containing from two to four carbon atoms are extracted from dilute aqueous solutions with an organic liquid comprising one or more of the following extractants: dialkyl alkyl phosphonates, alkyl dialkyl phosphinates, trialkyl phosphine oxides, dialkyl alicyclic amidophosphates, dialkyl sulfoxides and tetralkyl ureas. An improved method for removing carboxylic acid contaminants from aqueous effluents or recycle streams is provided.

3,816,525

PROCESS FOR OXIDATION OF VICINAL DIOL GROUPS INTO CARBOXYL GROUPS WITH OXYGEN

Gerd Schreyer, Grossauheim, Werner Schwarze, Frankfurt, Wolfgang Weigert, Offenbach, and Horst Weigel, Bad Vilbel, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed July 26, 1971, Ser. No. 166,250

Claims priority, application Germany, Oct. 28, 1970, P 20 52 815.8; Feb. 13, 1971, P 21 06 913.6

Int. Cl. C07c *51/24, 55/02, 55/18*

U.S. Cl. 260—531 R **6 Claims**

A process for oxidizing the vicinal diol groups of organic diol compounds into carboxylic groups with oxygen

or an oxygen-containing gas in the presence of an inert single-phase aqueous or anhydrous organic solvent medium or a two-phase solvent system of water and an inert water-immiscible solvent, and in the presence of cobalt ions or a cobalt compound, as well as in the presence of a percarboxylic acid, wherein the cobalt ions or the cobalt compound are provided in catalytic amounts and the percarboxylic acid is present, at least at the beginning of the oxygen oxidation, in an amount which is sufficient for at least partial transformation of the cobalt ions or the cobalt compound to a higher valence.

3,816,526

METHOD FOR PRODUCING HALOBENZOYL HALIDES

Anthony T. Jurewicz, Kendall Park, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Oct. 3, 1972, Ser. No. 294,750

Int. Cl. C07c *63/10*

U.S. Cl. 260—544 M **9 Claims**

Halogenation of benzoyl halide in the presence of a ferric halide catalyst and a halogenated hydrocarbon solvent provide higher yields of the meta isomer of monohalogenated benzoyl halide.

3,816,527

BIS-META-PHENYLENE UREAS AND THEIR UTILITY AS HERBICIDES

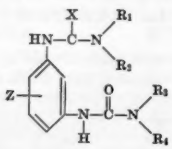
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

No Drawing. Original application Oct. 12, 1972, Ser. No. 80,120, now Patent No. 3,707,556. Divided and this application Oct. 2, 1972, Ser. No. 294,112

Int. Cl. C07c *127/00*

U.S. Cl. 260—552 R **2 Claims**

Bis-meta-phenylene ureas having the formula:



in which X represents oxygen or sulfur, R_1 represents lower alkyl or lower alkenyl, R_2 is hydrogen, R_3 represents alkyl, alkenyl, chloroacetyl, phenyl and chloro substituted phenyl, R_4 represents hydrogen, lower alkyl and furfuryl, and Z represents hydrogen or lower alkyl. The compounds of this invention are useful as herbicides.

3,816,528

UREA SYNTHESIS PROCESS

Lucien H. Cook, Port Washington, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,754

Int. Cl. C07c *127/00*

U.S. Cl. 260—555 A **6 Claims**

A urea synthesis process employing ammonia and carbon dioxide as feed reactants, in which mixed off-gas derived from ammonium carbamate decomposition is compressed together with feed carbon dioxide to urea synthesis pressure and reacted exothermically with feed ammonia while in heat exchange with urea synthesis effluent stream, which is concomitantly stripped with intermediate pressure recycle mixed gas.

3,816,529

N-CARBAMOYLETHYL AROMATIC AMINE COMPOUNDS

Frank Fred Loffelman, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

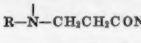
No Drawing. Continuation-in-part of abandoned application Ser. No. 825,434, May 16, 1969, which is a continuation-in-part of application Ser. No. 693,720, Dec. 27, 1967, now Patent No. 3,503,953, which is a continuation-in-part of application Ser. No. 420,448, Dec. 22, 1964, which in turn is a continuation-in-part of application Ser. No. 335,682, Jan. 3, 1964, both now abandoned. This application Feb. 24, 1971, Ser. No. 118,511

Int. Cl. C07c *103/28*

U.S. Cl. 260—558 A **4 Claims**

N-carbamoylethyl aromatic amines are provided which have the formula

where Ar is a radical of the benzene, biphenyl or naphthalene series; R^1 is the group



where R is hydrogen, methyl, ethyl, 2-hydroxyethyl or 2-carbamoylethyl; R^2 is amino, nitro or 2-carbamoylethylamino; and R^3 is amino, nitro, hydrogen, halo, lower alkyl, lower alkoxy, lower alkylamino, lower dialkylamino or 2-hydroxyethylamino; and acid addition salts thereof. These compounds are useful as direct or oxidation dyes for keratinaceous materials such as hair and fur or as intermediates in the preparation of dyes including methylolated, alkoxymethylolated or acyloxymethylolated dyes which chemically bond to polymeric substrates such as cellulose.

3,816,530

NOVEL CHEMICAL COMPOUNDS AND PROCESSES FOR PREPARING SAME

Bruce O. Linn, Somerville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Nov. 19, 1971, Ser. No. 200,584

Int. Cl. C07c *129/08*

U.S. Cl. 260—564 F **6 Claims**

Novel nuclearly substituted 1-(cinnamylidene-amino)-3-benzylideneamino-guanidines and their acid addition salts are useful in the prevention and control of poultry coccidiosis. The compounds may be prepared by the reaction of a 1-amino-3-(substituted benzylideneamino)-guanidine with a substituted cinnamaldehyde or alkyl styryl ketone, or, alternatively, by reaction of a 3-amino-1-(substituted - cinnamylideneamino) - guanidine with a nuclearly substituted benzylaldehyde or alkyl phenyl ketone. As coccidostats, the products are formulated into poultry feed pre-mixes, finished poultry feeds and aqueous formulations for drinking water.

3,816,531
(2,6 - DISUBSTITUTED BENZYLIDENE)AMINO GUANIDINES AND RELATED COMPOUNDS

William F. Bruce, Havertown, and Thomas Baum, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 60,201, July 1, 1970, which is a division of application Ser. No. 786,774, Dec. 24, 1968, which in turn is a continuation-in-part of abandoned applications Ser. No. 675,026, Oct. 13, 1967, and Ser. No. 754,494, Aug. 21, 1968. This application Aug. 10, 1972, Ser. No. 279,424

Int. Cl. C07c *129/08*

U.S. Cl. 260—564 F **1 Claim**

This invention is concerned with (2,6-disubstituted benzylidene)amino guanidines and related compounds useful as hypotensive agents. Further, it relates to compositions of compounds which are useful in suppressing hypertension.

3,816,532
KETOXIME CARBAMATE PESTICIDES

Frank Muller, Evenhausen, near Wasserburg am Inn, Werner Lohringer, Munich, Karl Milles, Holzkirchen, and Hermann Braunling and Helmut Prigge, Munich, Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Germany

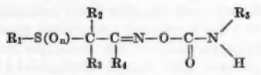
No Drawing. Filed July 15, 1971, Ser. No. 163,072

Claims priority, application Germany, July 23, 1970, P 20 36 491.4

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 AC **2 Claims**

Pesticides having a content of one or several ketoxime carbamates of the general formula



where R_1 is methyl or ethyl, R_2 and R_3 hydrogen, methyl or ethyl, R_4 methyl or ethyl, R_3 and R_4 can be connected together to form a ring with 12 carbon atoms at the most, preferably up to 6, R_5 is hydrogen, methyl or ethyl, and n=0, 1 or 2.

3,816,533
CRYSTALLINE HYDROGENSULFATES OF QUATERNARY AMMONIUM COMPOUNDS AND THEIR USE

Arne Elof Brandstrom, Goteborg, Klas Ragnar Gustavil, Kungsbacka, Ulf Krister Junggren, Pixbo, and Bo Robert Lamm, Goteborg, Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

No Drawing. Filed June 10, 1970, Ser. No. 45,257

Claims priority, application Sweden, June 12, 1969, 8,343/69

Int. Cl. C07c *87/04*

U.S. Cl. 260—567.6 M **4 Claims**

Crystallized hydrogensulfates of quaternary ammonium compounds described by the general formula

$$(R^1)_3R^2N^+HSO_4^-$$

wherein R^2 is selected from the group consisting of saturated alkyl groups having from 3 to 6 carbon atoms and aryl, preferably phenyl or monosubstituted phenyl and R^1 is selected from the group consisting of saturated alkyl groups having from 1 to 6 carbon atoms provided that when R^2 is an alkyl group having from 3 to 6 carbon atoms, R^1 must be an alkyl group having from 3 to 6 carbon atoms. Such compounds are useful in chemical and physical-chemical operations in analytical and preparative organic chemistry, e.g. in ion-pair extractions and as enforcing electrolyte in polarography and synthetic electrochemistry. Methods for their preparation and for carrying out ion-pair extractions are also described.

3,816,534
14 - OXOBICYCLO[10.4.0]HEXADEC - 1(12) - ENE, 14 - OXOBICYCLO[10.4.0]HEXADEC - 12 - ENE, 14 - OXOBICYCLO[10.4.0] - HEXADECANE AND PROCESSES FOR THEIR PREPARATION

Seymour Lemberg, Elizabeth, and Audley L. Cain, Hackensack, N.J., assignors to Stepan Chemical Company, Maywood, N.J.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,113

Int. Cl. C07c *49/44*

U.S. Cl. 260—586 R **8 Claims**

14 - Oxobicyclo[10.4.0]hexadec-1(12)-ene (I), which has an extremely strong, sweet musk odor and is useful in the perfume art as an odorant, is prepared by reaction of cyclododecane with morpholine to produce 1-morpholinocyclododecene, reaction of this product with methyl vinyl ketone followed by acid hydrolysis to form 2-(3-oxobutyl)cyclododecanone, and base-catalyzed cyclization of this diketone to a mixture of (I) and its isomer 14-oxobicyclo[10.4.0]hexadec-12-ene (II) containing less than about 10% of (I). A product enriched in (I) is obtained by distillation of this mixture in the presence of base, or by ketallization of (I) and (II) followed by hydrolysis. Hydrogenation of (I) or (II) or hydrogenation of their ketals followed by hydrolysis yields 14-oxobicyclo [10.4.0]hexadecane, which has a musky odor and, like (I), is useful as an odorant.

3,816,535
PROCESS FOR THE CATALYTIC ISOMERIZATION OF UNSATURATED KETONES

Marianne Hug-Inderbitzin, Schwerzenbach, Mario Pesaro, Zurich, and Peter Schudel, Grut, near Wetzikon, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,402

Claims priority, application Switzerland, Dec. 20, 1969, 19,397/69

Int. Cl. C07c *45/00*

U.S. Cl. 260—586 R **9 Claims**

There is provided a process for the catalytic isomerisation of olefinically unsaturated compounds to thermodynamically more stable isomers, in which there is used as the catalyst a salt of a transition element of the 4th period of the periodic system having an atomic weight greater than 50.

3,816,536
2-2-DISUBSTITUTED CYCLOALKANE-1,3-DIONES

Ulrich Eder and Gerhard Sauer, Berlin, Germany, assignor to Schering AG, Berlin & Bergkamen, Germany

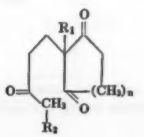
No Drawing. Filed Apr. 2, 1971, Ser. No. 113,223

Claims priority, application Germany, Apr. 4, 1970, P 20 16 750.4

Int. Cl. C07c *45/00*

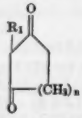
U.S. Cl. 260—586 R **8 Claims**

2,2-Disubstituted cycloalkane-1,3-diones having the formula:



(I)

wherein n is 1 or 2, R_1 is lower alkyl, and R_2 is hydrogen or an organic group prepared by reacting a cycloalkane-1,3-dione having the formula:



(II)

wherein n and R_1 have the same meaning as above in a solvent or mixture of solvents in the absence of any catalyst with a vinylketone having the formula:

$$R_2CH_2COCH=CH_2 \qquad \text{(III)}$$

wherein R_2 has the same meaning as above.

3,816,537
PROCESS FOR THE ISOMERISATION OF NOPINONE

Giuliano Bozzato, Kusnacht, and Mario Pesaro, Zurich, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

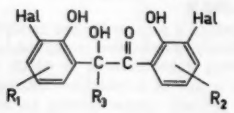
No Drawing. Filed Nov. 26, 1971, Ser. No. 203,114
Claims priority, application Switzerland, Dec. 11, 1970, 18,382/70
Int. Cl. C07c *45/00*
U.S. Cl. 260—586 R **4 Claims**

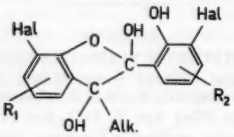
There is disclosed a process for the formation of 4-isopropenyl - cyclohexanone and 4 - isopropylidene - cyclohexanone by the isomerisation of nopinone wherein nopinone is treated with an orthoformic acid lower alkyl ester in the presence of an acidic catalyst and the reaction product is subjected to acidic hydrolysis.

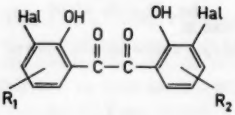
3,816,538
HALOGENATED SALICOINS HAVING ANTI-PARASITIC ACTIVITIES

Hans Heinz Haeck and Willen Jan Pereboom, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 18, 1971, Ser. No. 154,280
Claims priority, application Netherlands, June 20, 1970, 7009085
Int. Cl. C07c *49/80*
U.S. Cl. 260—590 **7 Claims**







Polyhalogenated salicoins found useful for controlling liver flukes, an example being 3,3′-dichloro-5,5′-bibromosalicoin.

3,816,539
METHOD FOR MAKING A STABILIZED SOLUTION OF CONCENTRATED AQUEOUS FORMALDEHYDE

James E. Sanborn, Summit, N.J., William R. Lemmons, Kingsville, Tex., and James M. Ramey, Taponah, N.Y., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Dec. 18, 1968, Ser. No. 785,455
Int. Cl. C07c *47/04*
U.S. Cl. 260—606 **9 Claims**

Stabilized, concentrated aqueous formaldehyde, obtained by preparing a warm stabilizing solution of between about 0.5 and 2.0 weight percent polyvinyl formal dissolved in a solvent of concentrated solution of formaldehyde in aqueous methanol, and admixing the stabilizing solution with a warm, concentrated aqueous formaldehyde solution. Admixing is done in such proportions that the concentration of polyvinyl formal in the formaldehyde solution is at least about 1 p.p.m. and most advantageously is between about 2 and 20 p.p.m.

3,816,540
PREPARATION OF HYDRO-PEROXIDES BY AUTOXIDATION

Bruno J. Barone and Stone D. Cooley, Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Texas

No Drawing. Filed May 24, 1971, Ser. No. 146,453
Int. Cl. C07c *73/06*
U.S. Cl. 260—610 B **16 Claims**

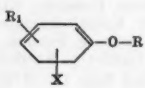
In autoxidation of tertiary, aryl or cycloalkanes the selectivity for organic hydroperoxides can be substantially increased by using selected polyphosphate compounds as catalyst. For example an autoxidation of isopentane with .05 wt. percent Mg pyrophosphate at 11.1 mole percent conversion gave selectivities of t-amyl hydroperoxides—74.0 mole percent acetone—14.2 mole percent and t-amyl alcohol—5.6 mole percent. The same reaction without the catalyst at 10.3 mole percent conversion gave selectivities of t-amyl hydroperoxide—30.6 mole percent acetone—51.2 mole percent and t-amyl alcohol—14.9 mole percent.

3,816,541
ARYL ACETYLENE ETHERS

Alexander Mihailovski, Berkeley, and Ferenc M. Pallos, Pleasant Hill, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,064
Int. Cl. C07c *43/22*
U.S. Cl. 260—613 D **8 Claims**

New compounds represented by the following generic formula



wherein R can be alkynyl; R_1 can be alkynoxy; X can be selected from the group consisting of hydrogen, alkyl, alkynoxy or halogen.

3,816,542
PROCESS FOR MAKING DIALKOXYPHENOLS

Edward F. Zaweski, Pleasant Ridge, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Nov. 15, 1971, Ser. No. 199,015
Int. Cl. C07c *41/00*
U.S. Cl. 260—613 D **10 Claims**

Reaction of a benzoquinone with a primary or secondary alkanol in the presence of a strong Friedel-Crafts catalyst yields a 2,4-dialkoxyphenol. For example, reaction of 2,6-di-*tert*-butyl-benzoquinone with methanol and BF_3 yields 2,4-dimethoxy-6-*tert*-butylphenol. The products are useful as antioxidants and antiozonants.

3,816,543

HYDROXYARYL ADDUCTS OF DECACHLORO-PENTACYCLO(5.3.0.0.^{2,6}.0^{4,10}.0^{5,9})DECANE - 3 - ONE AND ESTERS THEREOF

Stephen M. Creighton, Edmonton, Alberta, Canada, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation of application Ser. No. 592,719, Nov. 8, 1966, which is a continuation-in-part of application Ser. No. 191,703, May 2, 1962, both now abandoned. This application July 28, 1970, Ser. No. 64,089

Int. Cl. C07c *39/12*

U.S. Cl. 260—619 D 6 Claims

Hydroxyaromatic derivatives of decachloropentacyclo (5.3.0.0^{2,6}.0^{4,10}.0^{5,9})decane-3-one ($C_{10}Cl_{10}O$), methods for their production, and the reaction products of such derivatives with carboxylic compounds.

These compounds are useful as resin intermediates to prepare polyesters which can be further reacted to produce thermosetting plastics. Additionally, these compounds are useful as cross-linking agents for vinyl monomers.

3,816,544

NOVEL 4,4'-METHYLENEBIS(2,6-DIARALKYL-PHENOLS)

Gordon D. Brindell, Crystal Lake and Rudy (Rudolph) F. Macander, Cary, Ill., assignors to The Quaker Oats Company, Barrington, Ill.

No Drawing. Filed May 15, 1972, Ser. No. 253,342

Int. Cl. C07c *39/16*

U.S. Cl. 260—619 A 9 Claims

A new series of compounds having the following formula is disclosed:

wherein R_1, R_2, R_3, and R_4 are aralkyl with the proviso that the aralkyl group contains no branching on the carbon alpha to the phenylene group, said compounds useful to stabilize organic materials normally tending to undergo oxidative deterioration.

3,816,545

HYDROXYLATION OF AROMATIC COMPOUNDS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,698

Int. Cl. C07c *37/00*

U.S. Cl. 260—621 G 7 Claims

An improved process for the hydroxylation of an aromatic compound is effected by treating an aromatic compound with hydrogen peroxide in the presence of a catalyst comprising hydrogen fluoride and also in the presence of a catalyst modifier comprising an organosulfonic acid.

3,816,546

VAPOR PHASE CONVERSION OF ACETONE TO 3,5-XYLENOL IN A SINGLE STAGE

Robert W. Rieve, Springfield, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Apr. 12, 1972, Ser. No. 243,481

Int. Cl. C07c *37/00*

U.S. Cl. 260—621 R 7 Claims

Method for the vapor phase conversion of acetone to 3,5-xylenol in a single stage over a magnesium oxide catalyst. The advantages of this invention are excellent single stage selectivity to 3,5-xylenol and with recycling of intermediate products ultimate yields of 90 percent or more are obtainable.

3,816,547

PROCESS FOR THE PRODUCTION OF DIHYDROXYBENZENES

Efim Biller, Fribourg, Switzerland, Roman Goller, Burghausen, Germany, Richard Schlegel, Oberalm, Austria, and Hellmuth Pflugk, Wesseling, Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, Germany

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,900

Claims priority, application Germany, Dec. 8, 1969, P 19 61 445.0

Int. Cl. C07c *37/02*

U.S. Cl. 260—624 R 5 Claims

Hydrolyzing an aqueous solution of a chlorphenol with a stoichiometric amount of sodium hydroxide in the presence of a copper catalyst and a reducing agent, acidifying resulting reaction mixture and recovering dihydroxybenzene product.

3,816,548

CATALYTIC OXIDATION PROCESS FOR ISOPARAFFIN HYDROCARBONS

Robert H. Williams, Pennington, N.J., and Anthony J. Silverstri, Lower Makefield Township, Bucks County, and Robert L. Gorring, Upper Makefield Township, Bucks County, Pa., assignors to Mobil Oil Corporation

No Drawing. Filed Apr. 27, 1971, Ser. No. 137,959

Int. Cl. C07c *31/12, 27/12*

U.S. Cl. 260—632 C 5 Claims

A liquid phase oxidation process is provided for oxidation of isoparaffin hydrocarbons of from, for example, 4–16 carbon atoms or more to alcohols as the main product. Said process is preferably carried out at between about 50° C. and about 200° C. and between about 100 p.s.i. and about 1500 p.s.i. in the presence of certain metal phthalocyanines or mixtures thereof as a catalyst.

3,816,549

PURIFICATION OF ALKYLENE GLYCOLS

Roy H. Prinz, Robstown, Tex., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,641

Int. Cl. C07c *31/20*

U.S. Cl. 260—637 R 7 Claims

Process for improving the taste and/or odor characteristics of a crude alkylene glycol by subjecting the glycol to dual solvent extraction wherein water and a dialkyl ether are the dual solvents, the impurities being preferentially dissolved in the ether phase while the purified glycol is preferentially dissolved in the water phase.

3,816,550

CATALYTIC PROCESS FOR HYDRATION OF OLEFINS

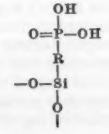
Frank G. Young, Charleston, and Leroy R. Pennington, Winfield, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Oct. 2, 1972, Ser. No. 293,766

Int. Cl. C07c *29/04, 29/10*

U.S. Cl. 260—641 9 Claims

A process for the direct hydration of olefins, e.g., of ethylene to produce ethanol comprising admixing ethylene and water in the vapor phase in the presence of a non-linear polymer catalyst composition consisting essentially of a recurring unit having the following structural formula:



wherein R is an unsubstituted or substituted straight or branched chain divalent saturated alkylene radical having 2 to 10 carbon atoms or an unsubstituted or substituted divalent aryl radical having 1 to 3 benzene rings wherein the substituents for the alkylene radical can be halogen or a phenyl radical and the substituents for the aryl radical can be halogen or straight or branched chain saturated alkyl radicals having 1 to 5 carbon atoms; and recovering ethanol.

3,816,551

SEPARATION BY CRYSTALLIZATION IN PRESENCE OF WATER

Roberto Lee, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 90,476, Nov. 17, 1970. This application Sept. 5, 1972, Ser. No. 285,993

Int. Cl. C07c *79/12*

U.S. Cl. 260—646 **5 Claims**

An improved process for separating an isomer from a mixture of isomers by crystallization, the improvement being the presence of water in the crystallizer to enhance crystallization. Isomers of halobenzene, nitrobenzene, nitrohalobenzene and mixtures thereof can be separated.

3,816,552

PROCESS FOR THE PREPARATION OF PERFLUORINATED COMPOUNDS

Robert Hartwimmer, Burghausen (Salzach), Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 22, 1971, Ser. No. 155,649

Claims priority, application Germany, June 24, 1970. P 20 31 047.8

Int. Cl. C07c *17/24, 23/00*

U.S. Cl. 260—648 F **11 Claims**

The present invention relates to a process for the preparation of cyclic perfluoro-olefins and certain derivatives by pyrolysis degradation of perfluorocarbon compounds and fluorocarbon waxes of mean and high molecular weight at temperatures of from 500° to 1000° C. and pressures of from 50 to 300 atm./g. The cyclic perfluoroolefins are suitable compounds for example for intermediate products and for co-monomers.

3,816,553

PERFLUOROMETHYLENECYCLOPROPANE

Bruce E. Smart, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Mar. 8, 1973, Ser. No. 339,422

Int. Cl. C07c *23/04*

U.S. Cl. 260—648 F **1 Claim**

Thermal reaction of excess hexafluoropropylene epoxide with 2,3-dichloro - 1,1,3,3 - tetrafluoropropene at 185–210° C. gives 1 - (chlorodifluoromethyl) - 1 - chloro-2,2,3,3 - tetrafluorocyclopropane which can be dechlorinated by zinc in the presence of a saturated aliphatic ether diluent at 70° C. to 140° C. to give perfluoromethylenecyclopropane. Perfluoromethylenecyclopropane can be homopolymerized or copolymerized with vinyl comonomers to useful polymers using free radical initiators. Polymerization occurs by opening of the cyclopropane ring so that the copolymer contains pendant difluoromethylene groups which provide crosslinking sites.

3,816,554

PROCESS FOR THE MANUFACTURE OF DICHLOROETHANE

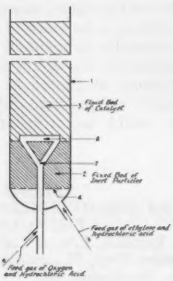
Cesare Reni, Varese, Luigi Lugo, Milan, and Giorgio Gualdi, Varese, Italy, assignors to Societá Italiana Resine S.p.A., Milan, Italy

Filed Oct. 22, 1970, Ser. No. 83,047

Claims priority, application Italy, Nov. 14, 1969, 24,406/69

Int. Cl. C07c *17/02*

U.S. Cl. 260—659 A **8 Claims**



In a reactor of length-to-diameter ratio of at least 3:1 a bottom zone comprises a fixed bed of solid inert particles, while a top zone comprises a fluidizeable bed of supported catalyst; a first gaseous stream comprising ethylene and hydrogen chloride and a second gaseous stream comprising molecular oxygen and hydrogen chloride are fed in preheated condition through their respective beds in an amount keeping the catalytic bed in fluidized condition.

3,816,555

PROCESS FOR OLIGOMERISING MONO-OLEFINS

Keith George Allum, Bracknell, England, assignor to The British Petroleum Company, Limited, London, England

No Drawing. Original application June 4, 1970, Ser. No. 43,554, now Patent No. 3,729,428. Divided and this application June 6, 1972, Ser. No. 260,192

Claims priority, application Great Britain, June 17, 1969, 30,578/69

Int. Cl. C07c *3/20*

U.S. Cl. 260—683.15 R **3 Claims**

A catalyst for the oligomerisation of olefins e.g. butenes to octenes and dodecenes, is prepared by contacting silica gel sequentially with aqueous solutions containing (i) aluminium ions, (ii) alkali metal ions, (iii) nickel ions in that order, and then activating the catalyst by heating in air or an inert gas to 400–1000° C. The oligomers have a low degree of branching, and are produced by contacting the catalyst with the olefin at a temperature from 0 to 300° C. and a pressure from 0 to 5000 p.s.i.g.

3,816,556

COMPOSITION COMPRISING A POLYSALT AND PAPER MADE THEREWITH

Anthony Thomas Coscia, South Norwalk, and Laurence Lyman Williams, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed June 9, 1972, Ser. No. 261,494

Int. Cl. C08g *45/04*

U.S. Cl. 260—836 **3 Claims**

There is provided a polysalt consisting essentially of (a) an anionic, water-soluble polyacrylamide having a

sufficient number of glyoxal-reactive amide substituents and glyoxalated amide substituents to be thermosetting, and (b) a water-soluble, cationic, thermosetting, wet-strength resin for paper, said resin containing amine groups reacted with epichlorohydrin, the molar ratio of the anionic substituents in said polysalt to the cationic substituents therein being between about 1:99 and 25:75, and a method for its incorporation into paper pulp so as to impart enhanced wet strength thereto.

3,816,557

SEALER COMPOSITION OF AN ACRYLIC-EPOXY ESTER GRAFT COPOLYMER AND AN EPOXY RESIN

Ralph G. Swanson and Aloysius N. Walus, Flint, Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,705

Int. Cl. C08g *45/04*

U.S. Cl. 260—837 **4 Claims**

The sealer composition contains a polymeric binder dissolved in an organic solvent in which the polymeric binder comprises the following components:

(A) an acrylic-epoxy ester graft copolymer that as a backbone of methyl methacrylate, styrene, ethyl acrylate, acrylonitrile or mixtures thereof, contains 1–7% of methacrylic acid or acrylic acid which has been reacted with an alkylene imine and the polymeric side-chain segments of the graft copolymer are epoxy esters of an epoxy resin and an aliphatic dicarboxylic acid; and

(B) an epoxy hydroxy polyether resin;

the novel composition forms a high quality coating and is particularly useful as a sealer composition for automobiles and trucks.

3,816,558

FILLED ALDEHYDE CONDENSATES HAVING IMPROVED HEAT RESISTANCE

Rodney M. Huck, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation of abandoned application Ser. No. 125,617, Mar. 18, 1972. This application Jan. 18, 1973, Ser. No. 324,716

Int. Cl. C08g *37/16, 37/32*

U.S. Cl. 260—838 **12 Claims**

Thermosettable compositions of a reactive filler and thermosettable resin of the aminoplast or phenoplast type. The filler is a devolatilized product of aromatic polycarboxylic compound, amine modified novolac resin and/or aromatic amine-aldehyde resin. Thermoset articles made from such compositions are characterized by improved (higher) service temperatures compared to the unfilled resin.

3,816,559

SOLID, CURABLE COMPOSITIONS CONTAINING OXOALKYL ACRYLAMIDES

Eugene Richard Farone, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation of abandoned application Ser. No. 56,698, July 20, 1970. This application Mar. 2, 1972, Ser. No. 231,401

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 **8 Claims**

Solid, curable solutions or dipsersions are formed by blending a polymer substantially free of ethylenic unsaturation, usually a thermoplastic polymer, with an oxoalkyl-substituted acrylamide such as diacetone acrylamide, heating to above the melting point of the latter, and then cooling. They may be cured (e.g., by the action of a free radical catalyst) under relatively unsophisticated conditions, such as in the home, to form useful and decorative coatings, laminates and adhesives.

3,816,560

POLYMERIZABLE COMPOSITIONS AND METHOD OF FORMING PRODUCTS THEREOF

Gilbert Chretien, Chauny, Philippe Girard, Autreville, Jean-Marc Lamy, Villequier-Aumont, and Christophe Menard, Sinceny, France, assignors to Rhone-Progil, Paris, France

No Drawing. Filed Oct. 5, 1972, Ser. No. 295,341

Claims priority, application France, Oct. 6, 1971, 7135951

Int. Cl. C08f *1/60, 21/00, 21/02*

U.S. Cl. 260—861 **8 Claims**

A polymerizable composition formulated of an unsaturated polyester, at least one monomer having an ethylenic double bond and β-chloropropionyl peroxide and the method for producing shaped products thereof by forming material to the desired shape and allowing the shaped material to polymerize.

3,816,561

POLYESTER COMPOSITIONS FROM TRANS-PIPERYLENE-MALEIC ACID ADDUCTS AND HYDROGENATED BISPHENOL A

Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Mar. 13, 1972, Ser. No. 234,368

Int. Cl. C08g *17/12, 21/00, 21/02*

U.S. Cl. 260—871 **10 Claims**

This invention discloses a linear polyester comprising from about 10 to about 40 mole percent of an adduct of trans-piperylene and maleic acid or its anhydride; from about 10 to about 40 mole percent of dicarboxylic compound selected from the group consisting of maleic acid, maleic anhydride, fumaric acid, and mixtures thereof; and from about 50 to 70 mole percent glycol wherein about 10 to 100 mole percent of said glycol is hydrogenated bisphenol A.

3,816,562

STABILIZED POLYPHENYLENE ETHER COMPOSITIONS

Klaus E. Holoch, Roxheim, Pfalz, Germany, and Lester Adrian Doe, Jr., Newtown, Conn., assignors to General Electric Company

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,429

Int. Cl. C08g *43/00, 43/02, 51/60*

U.S. Cl. 260—874 **8 Claims**

There are provided stabilized compositions consisting of a major proportion of a thermoplastic resin having a polyphenylene ether component and a minor proportion of a stabilizer consisting of a compound containing at least one P-N bond, combined with an alkanolamine or a mixture thereof with a boron compound. The boron compound can include, carbon and hydrogen, in addition to oxygen.

3,816,563

THERMOPLASTIC COMPOSITIONS

Carl Fraser Mathews, 4 Bramshot Close, London Road, Hitchin, England; Eric Nield, 12A Beane Road, Watton-at-Stone, England; John Brewster Rose, "Uluvia," Pasture Road, Letchworth, England; and Peter Incledon Vincent, 27 Coneydale, Welwyn Garden City, England

No Drawing. Continuation-in-part of application Ser. No. 860,100, Sept. 22, 1969, which is a continuation of application Ser. No. 539,738, Apr. 4, 1966, both now abandoned. This application Mar. 22, 1972, Ser. No. 236,976

Int. Cl. C08f *19/18*

U.S. Cl. 260—876 R **6 Claims**

Graft copolymers comprising a substrate of a diene rubber and a superstrate containing a high proportion of copolymerised acrylonitrile and blends of such graft copolymers with polymers containing a high proportion of acrylonitrile units.

3,816,564

INSULATION COATING COMPOSITIONS

Harvey Ray Holliday, Belleville, Ill., and Gary Lee Schurter, St. Louis, Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

No Drawing. Filed Feb. 2, 1972, Ser. No. 222,994

Int. Cl. C08f *15/00, 29/00*

U.S. Cl. 260—878 R 13 Claims

A composition is disclosed for use in providing electrical insulation. The composition is one which may be dip-coated and cured to provide superior resistance to temperature, abrasion, and to provide high electrical resistance. The compositions disclosed comprise a curable composition comprising a mixture of a polyolefin, polyvinyl chloride and a reactive allylic or vinylic compound or mixture. The composition may then be coated or applied to the electrical member and cured.

3,816,565

PARTICLE SIZE CONTROL OF BULK POLYMERIZED VINYL CHLORIDE POLYMERS AND COPOLYMERS

Akio Takahashi, Buffalo, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed May 8, 1972, Ser. No. 251,038

Int. Cl. C08f *15/00*

U.S. Cl. 260—884 3 Claims

In a process of bulk polymerization involving two-stage polymerization wherein high speed agitation is used during the first stage and slow speed agitation is used in the second stage, the polymerization in the first stage is conducted in contact with an N-vinyl pyrrolidone to produce small particle size polyvinyl chloride homopolymers or copolymers useful as extender resins in plastisols, which are used to produce protective, decorative, and adhesive coatings.

3,816,566

GRAFT COPOLYMER OF LACTONE POLYESTERS AND BLENDS THEREOF WITH PVC

Frank E. Critchfield, South Charleston, and Joseph V. Koleske, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Jan. 26, 1971, Ser. No. 109,982, now Patent No. 3,760,034. Divided and this application July 19, 1972, Ser. No. 273,300

Int. Cl. C08f *29/56*

U.S. Cl. 260—898 4 Claims

Various ethylenically unsaturated monomers can be graft copolymerized onto lactone polyesters, such as, homopolymers of ϵ-caprolactone or copolymers of ϵ-caprolactone and ϵ-alkyl-ϵ-caprolactones at temperatures between 90° and 150° C. The resultant graft copolymers can be used as plasticizers for polyvinyl chloride resins.

3,816,567

PROCESS FOR PRODUCING BUTADIENE POLYMER

Yoshiharu Yagi, Toyonaka, Hiroshi Sato, Takatsuki, Shizuo Narisawa and Seimei Yasui, Ibaragi, Akira Kobayashi, Nishinomiya, and Minoru Hino and Kazuhiko Hata, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Dec. 27, 1971, Ser. No. 212,664

Claims priority, application Japan, Dec. 28, 1970, 46/129,958, 46/129,961, 46/129,963; Dec. 29, 1970, 46/124,347, 46/124,349

Int. Cl. C08d *1/14, 3/06*

U.S. Cl. 260—94.3 8 Claims

A process for producing butadiene polymer which comprises polymerizing 1,3-butadiene in the presence of novel catalyst systems. The produced butadiene polymer contains predominantly cis-1,4-structure.

3,816,568

N,N'-DIARYLOXAMIDES CONTAINING PHOSPHORUS

Kurt Hofer, Muenchenstein, Basel-Land, and Rudolf Moesch, Stein, Aargau, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

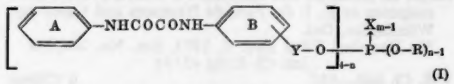
No Drawing. Filed Oct. 13, 1971, Ser. No. 189,022

Claims priority, application Switzerland, Oct. 13, 1970, 15,109/70

Int. Cl. C07f *9/08*

U.S. Cl. 260—944 15 Claims

Organic phosphorus compounds of the formula



(I)

where the benzene nuclei A and B may be substituted,

m stands for 1 or 2,

n for 1, 2 or 3,

R for hydrogen or an alkyl, cycloalkyl or phenyl radical which may be substituted,

X for O or S, and

Y for the direct single bond or an alkylene radical which is bound directly or through an O or S atom to the benzene nucleus B and may be interrupted by O atoms.

which protect sensitive organic materials, notably plastics, from the detrimental action of light, heat and oxygen.

3,816,569

O-PHENYL S-ARYL ALKYLPHOSPHONODITHIOATES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 11,912, Feb. 16, 1970. This application June 2, 1972, Ser. No. 258,969

Int. Cl. A01n *9/36;* C07f *9/40*

U.S. Cl. 260—961 12 Claims

S-aryl O-phenyl alkylphosphonodithioates are useful as insecticides. In particular, S-(p-tolyl) O-phenyl methylphosphonodithioate for use in combating soil insects of the genus *Diabrotica.*

3,816,570

PROCESS FOR PREPARING ENAMINE PHOSPHORUS COMPOUNDS

Wataru Nagata, Nishinomiya, and Yoshio Hayase, Sakai, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

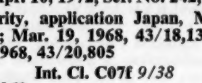
No Drawing. Original application Feb. 27, 1969, Ser. No. 830,106, now Patent No. 3,673,284. Divided and this application Apr. 10, 1972, Ser. No. 242,781

Claims priority, application Japan, Mar. 7, 1968, 43/14,901; Mar. 19, 1968, 43/18,134, 43/18,135; Mar. 30, 1968, 43/20,805

Int. Cl. C07f *9/38*

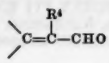
U.S. Cl. 260—968 2 Claims

Reagents for aldehyde synthesis, particularly for formyl-olefination, of the general formula:



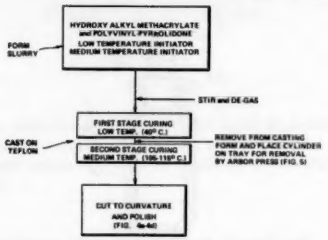
wherein R^1 represents a lower alkyl group, R^2 represents R^1O or an alkyl, aralkyl or aryl group, R^3 represents an acyclic or cyclic alkyl or aryl group, and R^4 represents a hydrogen atom, an alkyl, aralkyl or alkoxycarbonyl group or a halogen atom, which react with carbonyl

compounds >C=O to yield α,β-unsaturated aldehydes of the general formula:



wherein R^4 has the same meaning as described above.

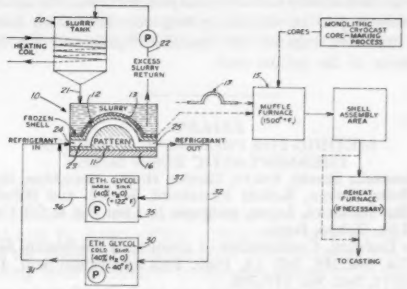
3,816,571
FABRICATION OF SOFT PLASTIC LENS
Kenneth F. O'Driscoll, Williamsville, and Allan A. Isen, Buffalo, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.
Original application Nov. 30, 1969, Ser. No. 880,828, now Patent No. 3,700,761. Divided and this application Aug. 25, 1972, Ser. No. 283,736
Int. Cl. B29d *11/00*
U.S. Cl. 264—1 **6 Claims**


HYDROXY ALKYL METHACRYLATE and POLYVINYL PYRROLIDONE
LOW TEMPERATURE INITIATOR
MEDIUM TEMPERATURE INITIATOR
FORM SLURRY
STIR and DE-GAS
FIRST STAGE CURING
LOW TEMP. (40° C.)
CAST ON TEFLON
SECOND STAGE CURING
MEDIUM TEMP. (105-110° C.)
REMOVE FROM CASTING FORM AND PLACE CYLINDER ON TRAY FOR REMOVAL BY ARBOR PRESS (FIG. 5)
CUT TO CURVATURE AND POLISH

Graft or block copolymers of hydroxy alkyl methacrylate esters and polyvinyl pyrrolidone are (1) cast in a shaping mold as a monomer-polymer dispersion, polymerized to a solid at 40–60° C. in the presence of low and medium temperature free radical initiators, (2) the solid taken out of the mold and heated to 90–120° C., and then post-polymerized by (3) radiation while dry and by (4) hydrogen peroxide treatment to form hygroscopic, solid, shaped masses which may be cut in the dry state, after step (1), into contact lenses. The lenses may be equilibrated in the wet state by hydrating with normal saline solution. The lenses may be maintained by treatment with hydrogen peroxide. Steps (3) and (4) toughen the lens, increase its elasticity and its elastic recovery and improve its dimensional stability. From 20–45% by weight of polyvinyl pyrrolidone imparts hygroscopic and unusual water-swelling characteristics. The water-swollen lens contains from 40–80% water, preferably from 50–55%, and in isotonic saline, the water content changes to about 52–58%. As a result of the polyvinyl pyrrolidone incorporation, the lens is readily cleaned after use in the eye with dilute hydrogen peroxide to rid it of imbibed muco-protein, catalase and the like.

3,816,572
CERAMIC ARTICLES
Henry M. Roelofs, Chicago, Ill., assignor to Nalco Chemical Company, Chicago, Ill.
Filed Aug. 26, 1971, Ser. No. 175,053
Int. Cl. B05b *3/00*
U.S. Cl. 264—28 **5 Claims**

Ceramic shapes are produced cryogenically by in effect submerging a pattern in a slurry presenting the ceramic and circulating a refrigerant through the pattern to freeze the layer of slurry in contact with the replicating surface of the pattern, after which excess slurry is withdrawn and the frozen shell and pattern are separated. Freezing is continued for a short period after the slurry is withdrawn, the pattern is warmed after separation and steps

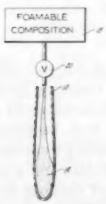


may be taken to maintain the supply of slurry at a constant temperature.

3,816,573
LAMINATED SKI HAVING CELLULAR PLASTIC CORE AND METHOD FOR PRODUCING THE SAME
Osamu Hashimoto and Yoshikazu Takabayashi, Hamamatsu, Japan, assignors to Nippon Gukki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Original application Nov. 13, 1970, Ser. No. 89,403, now abandoned. Divided and this application Mar. 6, 1972, Ser. No. 231,958
Int. Cl. A63c *5/04, 5/12*
U.S. Cl. 264—45 **8 Claims**

A ski core is made of cellular plastic material such as polyurethane foam having a specific gravity ranging from 0.4 to 0.7. For the production of the core, a mold is used which has a cavity substantially coinciding with the contour of the core. Ski top and bottom plates and/or side plates, as well as an H-shaped spacer interposed therebetween, may be positioned in the cavity before the foamable plastics is poured in the cavity so that the plates may be bonded to the core within the cavity at the same time when the core is produced. The H-shaped spacer is embedded in the core, serving as a reinforcement for the core.

3,816,574
METHOD OF FOAMING PLASTICS USING AN ALTERNATING MAGNETIC FIELD
William C. Heller, Jr., 1840 N. Farwell Ave., Milwaukee, Wis., and Alfred F. Leatherman, Columbus, Ohio; said Leatherman assignor to said Heller
Continuation-in-part of abandoned application Ser. No. 882,920, Dec. 8, 1969. This application Mar. 31, 1972, Ser. No. 239,919
Int. Cl. B29d *27/00;* **H05b** *9/00*
U.S. Cl. 264—45 **7 Claims**



A method of producing an article having a hollow shell filled with an expanded foam. The hollow shell is formed

of a material of which transmits an alternating magnetic field. The hollow shell is filled with a foaming agent comprised of a foamable liquid, having uniformly dispersed therein inductively heatable susceptor particles. The article is subjected to an alternating magnetic field which heats the particles, expands the foamable liquid, and fills the interior of the hollow shell.

3,816,575
METHOD FOR PREPARING A POROUS THERMOPLASTIC RESIN SHEET

Rinnosuke Susuki, Tokyo, Hiroshi Hoshi, Narashino, Jiro Saito, Tokyo, Keiichi Murakami, Sendai, and Humio Ito, Ichikawa, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

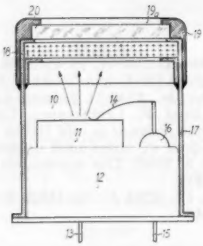
No Drawing. Continuation of abandoned application Ser. No. 842,385, July 16, 1969. This application Sept. 10, 1971, Ser. No. 179,595
Claims priority, application Japan, July 22, 1968, 43/51,217; Sept. 7, 1968, 43/64,447; Dec. 2, 1968, 43/87,594; Dec. 21, 1968, 43/93,870
The portion of the term of the patent subsequent to May 2, 1989, has been disclaimed
Int. Cl. B29d *7/20*
U.S. Cl. 260—49 **5 Claims**

A method for preparing a porous thermoplastic resin sheet comprising the processing steps of: forming a sheet with a composition containing thermoplastic resin kneaded together with acid-soluble inorganic particles and then soaking the sheet thus obtained in a treating liquid consisting of acid aqueous solution for dissolution of said inorganic particles out of said sheet.

3,816,576
PREPARING FLUORESCENT MATERIALS FOR OPTICAL FREQUENCY CONVERSION

François E. Auzel, 39 Avenue Port-Royal des Champs, Le Mesnil-Saint-Denis, France

Original application Feb. 8, 1971, Ser. No. 113,317, now Patent No. 3,709,827, dated Jan. 9, 1973. Divided and this application July 26, 1972, Ser. No. 275,435
Int. Cl. C04b *33/32*
U.S. Cl. 264—56 **2 Claims**



Fluorescent material for the optical frequency conversion of near infrared radiation from 0.85 to 1.06 μm. into visible radiation. The constituents of the material are (i) vitrifying fluorides of lead, beryllium and magnesium, (ii) devitrifying and activating fluoride of ytterbium and (iii) doping fluoride of erbium for a green and red response and doping fluoride of thulium for a blue response. The content of ytterbium fluoride controls the form of the material, either glassy ceramic or polycristalline. Proper preparation conditions allow to prepare either a glass material or a ceramic material.

3,816,577
METHOD OF DEODORIZING ANIMAL WASTE WITH CHERRY PIT EXTRACT

Edwin F. Neckermann, Kalamazoo, Mich., and James A. Hammer, Schaumburg, Ill., assignors to Beatrice Foods Co., Chicago, Ill.

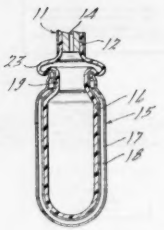
No Drawing. Filed Apr. 14, 1972, Ser. No. 244,236
Int. Cl. A61l *13/00;* **A47k** *11/00;* **E03d** *9/00*
U.S. Cl. 424—76 **20 Claims**

The present invention is concerned with deodorant materials for animal waste, and is especially concerned with a novel extract of cherry pits which has been found to be surprisingly effective for deodorizing animal waste.

3,816,578
METHOD OF BLOW MOLDING LINERS

George W. Fuller, Hampton, Conn., assignor to King-Seely Thermos Co., Norwich, Conn.

Filed Apr. 11, 1972, Ser. No. 242,925
Int. Cl. B29c *17/07;* **B32b** *1/10*
U.S. Cl. 264—98 **2 Claims**



A method of blow molding a liner into a vacuum filler and particularly to a method for lining a filler having a constricted neck. The blow molding operation is started at the closed end of the filler and progresses toward the open neck. The extrusion or blowing head has a smaller diameter than that of the neck so that the air entrapped during the blowing process may be expelled through the resulting gap. The method also permits the liner to be formed around the outer periphery of the neck.

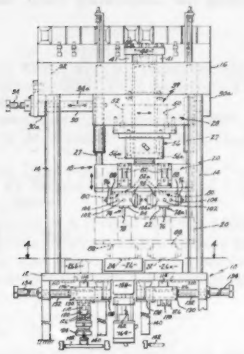
3,816,579
METHOD FOR BLOW MOLDING HOLLOW ARTICLES

Ernest P. Moslo, 12700 Lake Ave., Lakewood, Ohio 44107

Original application Feb. 26, 1970, Ser. No. 14,310, now Patent No. 3,664,798, dated May 23, 1972. Divided and this application Feb. 18, 1972, Ser. No. 227,576
Int. Cl. B29c *17/07*
U.S. Cl. 264—97 **9 Claims**

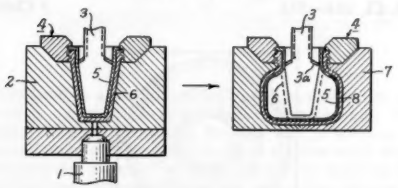
A method for producing hollow articles of plastic or the like such as, for instance, plastic bottles having a configured or threaded neck section and a substantially smooth surfaced, generally vertically oriented body section. The method includes forming a parison in a parison mold and then indexing the parison and moving the latter vertically into a blow mold for vertically blowing the article in the blow mold. The molds comprise a movable or expandable neck mold portion for forming the configured neck section of the molded article, and a body mold portion for forming the body section of the molded article. The body mold portion of the blow mold also includes a movable end wall defining the bottom of the body section of the molded article, and after blowing or formation of the article is accomplished, the end wall of the body mold portion is moved out of interfering relation and the neck mold portion is opened or expanded, to permit ejection of the molded article vertically out of

the blow mold. Means may be provided movable into coaction with the open-ended blow mold after movement of the end wall out of interfering relation, for directing the molded article to any desired location. Injection of



the plastic material into the parison mold is preferably accomplished vertically to form the aforementioned parison. The end result is a method requiring a minimum of floor space.

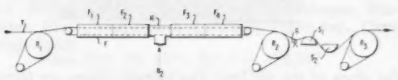
3,816,580
METHOD FOR THE PRODUCTION OF COMPOSITE ARTICLES
Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471
Filed Dec. 27, 1971, Ser. No. 211,898
The portion of the term of the patent subsequent to Mar. 6, 1990, has been disclaimed
Int. Cl. B29c *17/07*; B29f *1/10*
U.S. Cl. 264—97 **5 Claims**



Method for the production of composite articles for injection blow molded containers having a preformed inner lining which is applied to the core of the injection molding tool without immediate direct contact with the heated portions of that core. Substantial deformation of the liner is prevented by maintaining said liner prior to molding at a temperature below that at which deformation tends to take place.

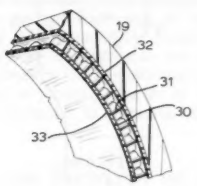
3,816,581
DRYING AND DRAWING PROCESS FOR POLYBENZIMIDAZOLE CONTINUOUS FILAMENTARY MATERIALS
Arthur E. Prince, Jr., Basking Ridge, N.J., assignor to Celanese Corporation, New York, N.Y.
Filed Mar. 31 ,1972, Ser. No. 239,898
Int. Cl. B29b *11/22*
U.S. Cl. 264—233 **7 Claims**

Polybenzimidazole continuous filamentary materials e.g., monofilament and multifilament strand, cable, yarn, tow, etc.) which contain any substantial quantities of residual moisture, such as solvent or wash water, may explode or burst during drawing. In the present process, the polybenzimidazole continuous filamentary material is dried by continuously passing the material in the direction of its length through an appropriate drying zone to



reduce the moisture content to a level at which the material may be drawn without substantially adversely affecting the tensile properties or color of the material. The resulting dried material is continuously passed in the direction of its length from the drying zone into a drawing zone and there drawn on a continuous basis.

3,816,582
PROCESS FOR THE MANUFACTURE OF CYLINDERS
Roderick C. Tennyson, 12 Shasta Drive, Thornhill, Ontario, Canada
Continuation-in-part of abandoned application Ser. No. 69,835, Sept. 4, 1970. This application Oct. 24, 1972, Ser. No. 300,018
Int. Cl. B29c *5/08*
U.S. Cl. 264—255 **6 Claims**



In the manufacture of cylinders comprising two concentric cylindrical shells with an interposed core comprising radially extending gas-filled cells a thin support layer which is porous to the material from which the inner shell is spun cast is applied to the inner face of the core and the inner shell is spun cast against the support layer.

3,816,583
PROCESS FOR THE MANUFACTURE OF SYNTHETIC BULKY FILAMENT FIBERS
Hiroshi Kashima, Hideyuki Tsujimoto, and Toshiaki Kakuda, Osaka, Japan, assignors to Asahi Kasei Kabushiki Kaisha, Osaka, Japan
Continuation-in-part of application Ser. No. 37,471, May 18, 1970, which is a continuation of application Ser. No. 694,466, Dec. 29, 1967, both now abandoned. This application Mar. 15, 1972, Ser. No. 234,872
Claims priority, application Japan, Dec. 30, 1966, 42/85,905
Int. Cl. B29c *15/00*
U.S. Cl. 264—282 **11 Claims**

A process for crimping synthetic thermoplastic continuous filament yarns is disclosed which comprises forcibly passing a plurality of continuous filament yarns against pressure, into a stuffing box through a pair of nip rolls, at least one of which is heated, wherein the filaments are fed to the nip rolls in a manner such that the filaments are arranged into from 2 to 3 compacted layers at the position where the filaments enter the nip line formed by

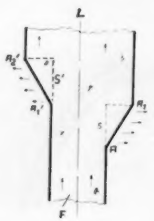
the nip rolls by laterally confining the filaments at the nip lines, thereby assuring that each filament tightly contacts each adjacent filament and that the filaments substantially fill the space at the nip line formed between the nip rolls. Such a process results in looped crimps in the filament yarns in a direction substantially perpendicular to

the plane of the nip line. The looped crimps are formed in a parallel fashion in the continuous yarns fed through the stuffing box, the word "parallel" indicating that the individual filaments are crimped in unison in order to more easily separate the individual filaments or groups of filaments from the plurality of yarns fed through the nip rolls and through the stuffing box.

3,816,584
ASYMMETRICAL TRANSVERSE STRETCHING OF PLASTIC FILM

Willi Johann Schmidt, Hahn, Taunus, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Mar. 2, 1972, Ser. No. 231,246
Claims priority, application Germany, Mar. 5, 1971, P 21 10 625.2
Int. Cl. B29d *7/24*
U.S. Cl. 264—289 **7 Claims**



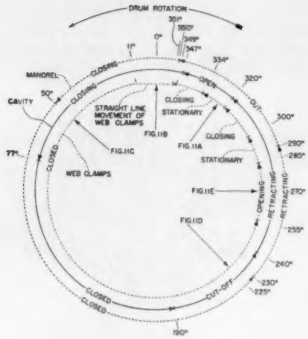
In the transverse stretching of webs of plastic film, in which the edges of the film are continuously held by holding elements while the web is being moved longitudinally, the distribution of flow lines is improved and the differences in thickness within the web are reduced, by asynchronously transversely stretching the web as by causing divergence of first one and then the other edge of the film relative to the direction of longitudinal movement. Preferably the respective divergences are geometrically identical, and/or are periodically displaced in the direction of the longitudinal axis and/or of the transverse axis of the web. The invention may be applied in multi-stage stretching processes and also in simultaneous transverse/longitudinal stretching processes.

3,816,585
CONTINUOUS MOTION CONTAINER MOLDING METHOD

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Original application July 28, 1969, Ser. No. 845,270. Divided and this application Apr. 22, 1971, Ser. No. 136,619
Int. Cl. B29d *23/13*
U.S. Cl. 264—297 **3 Claims**

A continuous motion container method molding machine is provided with cooperating molds which operate upon heated thermoplastic sheet or web material to form disposable containers. The heated sheet material web is continuously delivered to the cooperating molds, the transfer therebetween being accomplished by circumferential web clamping means along a coincidental path when synchronized with the speed of the moving web, thereby enabling the cooperating mold means to form

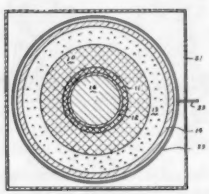


thin-wall, substantially uniform-in-thickness, containers from the material clamped off from the remainder of the moving web. Unique substations of the continuous motion container molding machine including sheet delivery, web clamping, scrap removal, and cup ejection substations are also disclosed.

3,816,586
METHOD OF FABRICATING BORON SUBOXIDE ARTICLES

Benjamin F. Goosey, Anderson, S.C., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Mar. 21, 1972, Ser. No. 236,632
Int. Cl. C04b *35/62*
U.S. Cl. 264—332 **3 Claims**



A method is provided for fabricating articles of boron suboxide and other boron-oxygen compositions in which a mixture of boron and boric oxide is initially compressed in a metal die lined successively with sheets of graphite and tantalum. After release of the pressure on the resulting compacted article, it is covered with a layer of a mixture of boron nitride and boric oxide. The compacted article coated with the aforementioned mixture is then subjected to a second compressing step in the lined die while heating the die at a temperature sufficient to melt the boric oxide in the compacted article. After allowing the die to cool, the compacted article, now coated with boron nitride, is removed from the metal die and placed in a graphite die coated with boron nitride and lined with a sheet of tantalum. While compressing the compacted and coated article in the graphite die at increasing pres-

sure, the die is heated in an inert atmosphere or under a vacuum. After permitting the graphite die to cool, the compacted and coated article is removed therefrom. An article of boron suboxide or other boron-oxygen composition is then obtained after removal of the boron nitride coating.

3,816,587

SELECTIVE CONCENTRATION OF GOLD, SILVER AND COPPER IN AQUEOUS CYANIDE SOLUTIONS

Lawrence Wayne Gosser, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 17, 1972, Ser. No. 244,880
Int. Cl. B01d *11/00;* **C01g** *5/00, 7/00*
U.S. Cl. 423—29 **9 Claims**

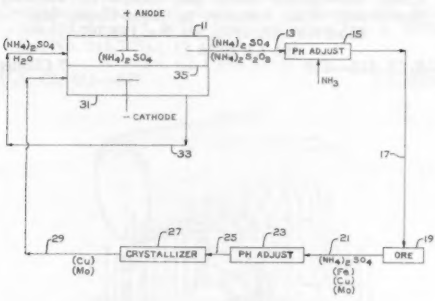
Disclosed herein is a reverse osmosis process for concentrating aqueous solutions of the cyanide complex salts of gold, silver and copper employing membranes fashioned from selected nitrogen-linked aromatic condensation polymers.

3,816,588

OPENING OF MOLYBDENITE ORES

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 11, 1973, Ser. No. 322,649
Int. Cl. C22b *49/00, 61/00*
U.S. Cl. 423—49 **12 Claims**



Disclosed is a method of separating molybdenum and rhenium contained in molybdenite bearing ores. The method involves contacting the ore with a solution of ammonium or a stable alkali metal or alkaline earth metal persulfate for a period of time sufficient to solublize the molybdenum. The inability of the persulfate solution to solubilize the rhenium renders the process suitable for selective leaching of molybdenum with subsequent recovery of undissolved rhenium.

3,816,589

PROCESS FOR RECOVERY OF VANADIUM VALUES FROM FERROPHOSPHORUS AND/OR FERROPHOSPHORUS MIXTURES

Joseph S. Fox, Lewiston, N.Y., David O. Skiles, Grand Junction, Colo., and Calvin G. Richardson, Malvern Park, Ark., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 124,484, Mar. 15, 1971. This application Apr. 4, 1973, Ser. No. 347,684
Int. Cl. C01g *31/00*
U.S. Cl. 423—68 **13 Claims**

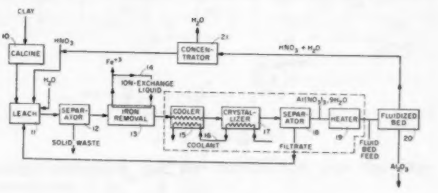
A vanadium extraction process comprising the roasting of a mixture of preoxidized ferrophosphorus with or without a vanadium-containing ore, an alkaline earth material and an alkaline metal salt. The calcined mixture is then leached in an aqueous solution and the leach liquor so formed is thereafter filtrated to extract the vanadium values therein.

3,816,590

METHOD AND APPARATUS FOR PROVIDING A PURE CONCENTRATED AQUEOUS SOLUTION OF ALUMINUM NITRATE

Paul A. Huska, Carlisle, and Herman P. Meissner, Winchester, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 18, 1971, Ser. No. 125,757
Int. Cl. C01b *7/30, 7/36*
U.S. Cl. 423—112 **12 Claims**



Method and apparatus for providing a concentrated aqueous aluminum nitrate solution as a feed liquid for hydrolysis in a fluidized bed. An aqueous solution of aluminum nitrate containing iron and other dissolved impurities is first contacted with an organic ion-exchange liquid to remove the iron and then pure aluminum nitrate nonahydrate is crystallized from the iron-free solution to remove the other impurities. Crystallization is carried out in a manner to prevent formation of basic aluminum nitrate. The pure aluminum nitrate nonahydrate crystals are heated to dissolve the aluminum salt in its water of hydration. The resulting 56.7% solution is used as feed in a fluidized bed to produce alumina of a purity which permits its direct reduction to aluminum metal.

3,816,591

PROCESS FOR THE RECOVERY OF ALUMINIUM AND FLUORINE FROM A DILUTE AQUEOUS SOLUTION

Alfred Schmidt, Linz (Danube), Austria, assignor to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz (Danube), Austria

No Drawing. Filed May 5, 1972, Ser. No. 250,820
Claims priority, application Austria, May 7, 1971, A 3,971/71
Int. Cl. C01b *9/08;* **C01f** *7/54*
U.S. Cl. 423—114 **2 Claims**

Process for the recovery of aluminium and fluorine values from dilute aqueous solutions containing aluminiumfluoride and silicofluoride whereby in said solution bound fluorine is present in excess with respect to aluminium by adding an ammoniacal medium in order to adjust the pH of said solution between 6 and 6.5 and separating the precipitated ammoniumfluoraluminate.

3,816,592

PROCESS FOR THE PURIFICATION OF RAW SODIUM CHLORIDE BRINES

Francesco Rinaldi, Follonica, Ferruccio Alberti, Milan, and Paolo Aguzzi, Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Nov. 18, 1971, Ser. No. 200,021
Claims priority, application Italy, Nov. 21, 1970, 32,023/70
Int. Cl. C01d *3/06, 3/16*
U.S. Cl. 423—190 **6 Claims**

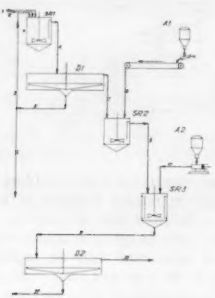
A process is disclosed for purifying raw sodium chloride brines containing impurities such as: Ca, Sr, Ba, Mg, Fe, Al and Ni, said process comprising the following

successive stages, conducted in a continuous way and at room temperature:

(a) the raw brine is mixed under stirring together with a solution containing SO_4^{--} ions and with a fraction of slurries thickened in the succeeding decanting stage (b), so as to obtain the precipitation, as sulphates, of up to 60% of the Ca^{++} ion and substantially all the Sr^{++} and Ba^{++} ions present in the mixture;

(b) the slurry thus obtained is left to decant, thereby separating a thickened substance which is partly recycled into the preceding stage (a), and the clarified substance which is sent to the subsequent purification stages;

(c) the brine clarified in the preceding stage (b) is treated with alkaline carbonate or with carbon dioxide,



under stirring, so as to complete the precipitation, in the form of carbonates, of the Ca^{++} ion that has remained in the solution and of the Sr^{++} and Ba^{++} ions possibly left in the solution;

(d) the slurry coming from the previous stage (c) is treated with caustic soda and, if desired, with a coagulant, under slight stirring, so as to precipitate as hydroxides, prevailingly in the form of flakes, substantially all the Mg^{++}, Fe^{+++}, Al^{+++} and Ni^{+++} ions present in the solution; and

(e) the slurry containing in suspension the carbonates precipitated in stage (c) and the hydroxides precipitated in stage (d) is left to decant so as to obtain, after settling of the solid phase, the purified brine product.

3,816,593
METHOD OF REGENERATING WASTE PICKLE LIQUOR
William L. Johnson, 1727 Chip-n-Dale, Arlington, Tex. 76010, and William R. Massey, Fort Worth, Tex.; said Massey assignor to said Johnson
No Drawing. Filed Nov. 30, 1971, Ser. No. 203,421
Int. Cl. C01b *17/90;* **C01g** *49/02*
U.S. Cl. 423—140 **9 Claims**

A process for regenerating aqueous sulfuric acid pickling liquor that contains residual iron-sulfur compounds characterized by the steps of (1) oxidizing the iron-sulfur compounds in at least a portion of the liquor; (2) partially neutralizing the portion of the liquor by raising its pH to at least 2 with the addition of a soluble caustic material, preferably one that contains a cation whose reaction product after the two steps forms a precipitate at a pH of 2 and higher; (3) separating the precipitates from the regenerated pickling liquor; and (4) returning the regenerated pickling liquor to pickling service. Also disclosed are specific preferred materials and processes employing additional steps.

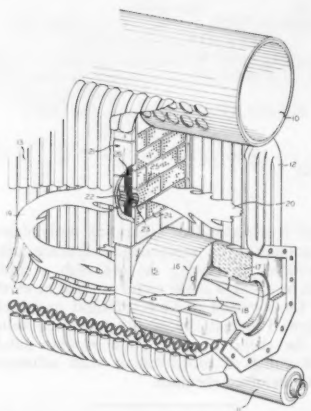
ERRATUM

For Class 423—213 see:
Patent No. 3,816,423

3,816,594
PROCESS FOR REDUCING THE CONTENT OF NITROGEN OXIDES IN THE EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES
Tadeusz P. Kobylinski, Cheswick, and Brian W. Taylor, Richland Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed May 30, 1972, Ser. No. 257,558
Int. Cl. B01d *53/34*
U.S. Cl. 423—213.5 **21 Claims**

In a process wherein an exhaust gas from an internal combustion engine containing nitrogen oxides as impurity is treated with a nickel, copper or iron catalyst under reducing conditions and the nitrogen oxides are converted to nitrogen and large amounts of ammonia, the improvement wherein the catalyst additionally contains ruthenium, with the result that substantially all of the nitrogen oxides are converted to nitrogen and little or no ammonia is formed.

3,816,595
METHOD AND APPARATUS FOR REMOVING NITROGEN OXIDES FROM A GAS STREAM
Paul G. LaHaye, Cape Elizabeth, Maine, and Glenn D. Craig, Menomonee Falls, and Joseph L. Turecek, Shorewood, Wis., assignors to Aqua-Chem, Inc.
Filed Nov. 15, 1971, Ser. No. 198,767
Int. Cl. B01d *53/34*
U.S. Cl. 423—239 **7 Claims**



Nitrogen oxides are separated from a hot gas mixture by placing the mixture in contact with a silicon compound such as silicon carbide.

3,816,596
METHOD OF MAKING A URANIUM-ANTIMONY OXIDE CATALYST
Kenneth V. Wise, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 4, 1971, Ser. No. 186,535
Int. Cl. C01g *43/00*
U.S. Cl. 423—253 **3 Claims**

An improved oxidation and/or ammoxidation catalyst based on antimony, uranium and oxygen is prepared by forming a solution of solubilized antimony oxides and

uranium salts or oxides, evaporating the solution to dryness to form a solid residue, drying the solid residue and heating the dried solid residue at a temperature of from 750° C. to 1000° C. A preferred embodiment produces a catalyst consisting essentially of a compound represented by the formula USb_3O_{10}. The catalyst is useful in oxidizing and ammoxidizing olefins.

3,816,597

FLUE GAS DESULFURIZATION USING SURFACE IMPREGNATED SORBENT

Warren M. Smith, Baton Rouge, La., assignor to Esso Research and Engineering Company

Filed Nov. 1, 1971, Ser. No. 194,472
Int. Cl. B01j *9/00;* **C01b** *17/60*
U.S. Cl. 423—244 **4 Claims**

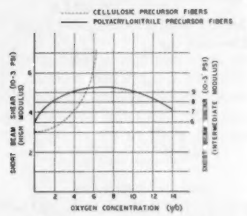
Sulfur dioxide is removed from flue gas by passing the flue gas through a fixed bed of a sorbent comprising an active material supported on a porous carrier, in which the active material is distributed predominantly in an outer layer of the carrier. The use of a surface coated rather than a fully impregnated sorbent improves the utilization of active material.

3,816,598

PROCESS FOR SURFACE TREATMENT OF GRAPHITE FIBERS

Andrew L. Cunningham, Sr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of abandoned application Ser. No. 144,418, May 17, 1971. This application Apr. 6, 1972, Ser. No. 241,725
Int. Cl. C01b *31/07*
U.S. Cl. 423—447 **7 Claims**


CELLULOSIC PRECURSOR FIBERS
POLYACRYLONITRILE PRECURSOR FIBERS
SHORT BEAM SHEAR (10-3 PSI) (ULTIMATE MODULUS)
SHORT BEAM SHEAR (10-3 PSI) (INTERMEDIATE MODULUS)
OXYGEN CONCENTRATION (Y0)

A process for the surface treatment of intermediate and high modulus graphite or carbon fiber by subjecting the fiber to a non-aqueous gaseous atmosphere of oxygen in an inert carrier gaseous medium at an elevated temperature. Proper selection of the concentration of oxygen and of the temperature increases the interlaminar shear strength of a graphite fiber-resin composite with minimal weight loss of the fiber and minimal degrading (if any) the tensile properties of the fiber.

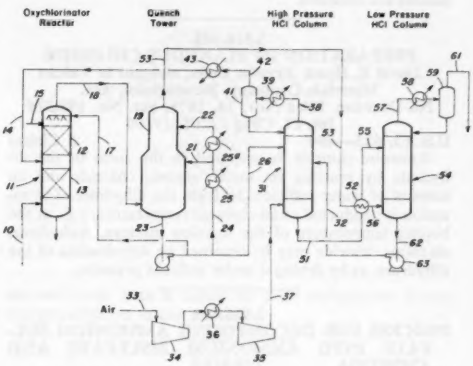
3,816,599

HYDROGEN CHLORIDE RECOVERY

Nicholas Kafes, Astoria, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 16, 1971, Ser. No. 199,234
Int. Cl. C01b *7/08*
U.S. Cl. 423—488 **10 Claims**

An off-gas from an oxychlorinator containing water vapor and hydrogen chloride is subjected to high pressure-low pressure azeotropic distillation to recover hydrogen chloride therefrom. An oxygen-containing gas is used as a stripping medium in the high pressure column and the hydrogen chloride of the off-gas is recovered with the



oxygen-containing gas for introduction into the oxychlorinator.

3,816,600

METHOD OF MANUFACTURING METAL FLUORIDES AND METAL FLUORIDE MIXTURES WHICH DO NOT COMPRISE OXYGEN

Albert Huizing, Emmasingel, Netherlands, and Johann Schroder, Aachen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Sept. 24, 1971, Ser. No. 183,670
Claims priority, application Netherlands, Sept. 25, 1970, 7014138
Int. Cl. C01d *11/02;* **C01g** *9/04, 51/08*
U.S. Cl. 423—489 **3 Claims**

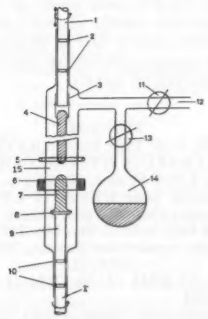
Manufacture of metal fluorides which contain less than 0.01% by weight of oxygen. The metal fluorides to be purified are treated in a molten state in an inert atmosphere with ammonium fluoride and/or ammonium bifluoride.

3,816,601

PROCESS FOR THE PRODUCTION OF PURE METAL HALIDES

Pierre Junod, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 5, 1971, Ser. No. 131,006
Claims priority, application Switzerland, Apr. 6, 1970, 5,062/70
Int. Cl. B01j *17/32;* **C01b** *9/00;* **C01g** *5/00*
U.S. Cl. 423—491 **14 Claims**



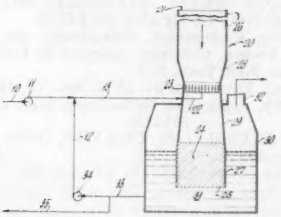
The process of this invention for the production of metal halides, especially silver halides, comprises reacting

the metal with the vapour of the halogen in a closed vessel. A mono- or polycrystalline metal halide body is built up on a stationary or rotating base. Very pure metal halides are obtained.

3,816,602
PREPARATION OF STANNOUS CHLORIDE
David E. Hyatt, Arvada, Colo., assignor to Vulcan Materials Company, Birmingham, Ala.
No Drawing. Filed Nov. 16, 1971, Ser. No. 199,375
Int. Cl. C01g *11/08, 19/06*
U.S. Cl. 423—494 **5 Claims**

Stannous chloride is prepared in the form of the dihydrate by reacting tin metal, stannic chloride and an amount of water sufficient to form the dihydrate. The reaction is conducted at an elevated temperature, e.g., at the boiling temperature of the reaction mixture. Anhydrous stannous chloride may be obtained by dehydration of the dihydrate, as by drying it under reduced pressure.

3,816,603
PROCESS FOR DECOMPOSING AMMONIUM SULFATE INTO AMMONIUM BISULFATE AND AMMONIA
Albert B. Welty, Jr., Westfield, N.J., assignor to Esso Research and Engineering Company
Filed Aug. 21, 1972, Ser. No. 282,352
Int. Cl. C01c *1/02, 1/04*
U.S. Cl. 423—520 **8 Claims**

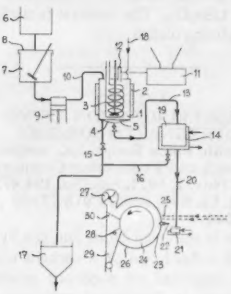


Process and apparatus for decomposing ammonium sulfate. An aqueous solution of ammonium sulfate at elevated temperature and pressure, e.g., about 475° F. and 450 p.s.i.g. is injected into a flowing stream of hot combustion gases which is initially at a temperature above the decomposition temperature of ammonium sulfate and at a pressure substantially lower than that of the ammonium sulfate solution. The water content of the solution is flash evaporated adiabatically and the ammonium sulfate, in the form of finely divided particles suspended in the combustion gas stream, is decomposed into ammonium bisulfate and ammonia. The apparatus includes an essentially tubular reactor having a plurality of venturi mixers therein, and a plurality of solution supply pipes for spraying ammonium sulfate solution into the throats of the venturi mixers.

3,816,604
PROCESS FOR THE PREPARATION OF ALKALINE HYPEROXIDE
Jean Malafosse, Lyon, France, assignor to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France
Filed July 3, 1972, Ser. No. 268,835
Claims priority, application France, Mar. 17, 1972, 7209323
Int. Cl. C01b *13/10;* **C01d** *11/00*
U.S. Cl. 423—581 **8 Claims**

Alkaline hyperoxides (superoxides) are prepared by forming.

A concentrated aqueous solution of alkaline hydroxide and hydrogen peroxide itself continuously prepared by adding the two reagents to a preformed mixture thereof, such that the alkaline hydroxide and hydrogen peroxide at a titer at least equal to 85% are maintained at molar ratio $1.5 \leqslant H_2O_2/MOH \leqslant 1.75$ and the temperature of the



solution is $<10°$ C.; and then alkaline hyperoxide is prepared from the said solution by continuous, punctual, rapid dehydration.

The resultant pulverulent compositions are particularly suitable for pelleting.

3,816,605
METHOD OF PROCESSING ALUMINUM-CONTAINING ORES
Milan Belsky, Schwandorf, Germany, assignor to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany
No Drawing. Continuation-in-part of abandoned application Ser. No. 248,521, Apr. 28, 1972. This application Aug. 31, 1972, Ser. No. 285,519
Claims priority, application Germany, Apr. 29, 1971, P 21 21 094.6
Int. Cl. C01b *7/08;* **C01f** *7/02, 7/56*
U.S. Cl. 423—626 **5 Claims**

Aluminum ores containing aluminum in the form of aluminum silicates are leached with an aqueous solution of hydrochloric and fluosilicic acid. The addition of the fluosilicic acid eliminates the need for the calcination of the aluminum ore prior to the acid treatment.

3,816,606
METHOD FOR PREPARING NON-SOLVATED ALUMINUM HYDRIDE
Theodore C. Kraus, Cheshire, Conn., assignor to Olin Mathieson Chemical Corporation
No Drawing. Filed Oct. 23, 1962, Ser. No. 234,576
Int. Cl. C01b *6/00*
U.S. Cl. 423—645 **6 Claims**

Non-solvated aluminum hydride is prepared by reacting sodium aluminum hydride with aluminum chloride in the presence of a minor amount of lithium aluminum hydride in a dialkyl ether solution. The resulting solvated aluminum hydride is then heated to give non-solvated aluminum hydride.

3,816,607
METHOD FOR THE PREPARATION OF BERYLLIUM HYDRIDE FROM A DIALKYL BERYLLIUM SOLUTION
Frederick W. Frey, Jr., and Paul Kobetz, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Oct. 2, 1964, Ser. No. 401,266
Int. Cl. C01b *6/00*
U.S. Cl. 423—645 **13 Claims**

An improvement in the method of forming beryllium hydride from an ether solution of dialkyl beryllium which comprises adding a stoichiometric excess of an alkali

metal hydride, then adding a beryllium halide to precipitate an alkali metal halide, and finally recovering beryllium hydride from the resulting solution by pyrolysis.

3,816,608

PREPARATION OF BERYLLIUM HYDRIDE BY PYROLYSIS OF A DI-TERTIARY-ALKYL BERYLLIUM ETHERATE

Ralph W. Baker, Greenwell Springs, and Charles R. Bergeron and Adam Nugent, Jr., Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 5, 1967, Ser. No. 674,058
Int. Cl. C01b *6/00*
U.S. Cl. 423—645 **4 Claims**

Beryllium hydride is prepared by the continuous pyrolysis of a tertiary alkyl beryllium compound. A stream of cold beryllium alkyl is contacted with a stream of hot inert solvent which provides the heat of pyrolysis. The reaction temperature is regulated by adjusting the relative flow rates of the reactants.

3,816,609

PROCESS FOR PRODUCING A GASEOUS COMPOSITION CONTAINING HYDROGEN OR HYDROGEN AND CARBON OXIDES

Glen P. Hamner, Baton Rouge, La., assignor to Esso Research and Engineering Company

Continuation-in-part of abandoned application Ser. No. 40,057, May 25, 1970. This application Mar. 24, 1972, Ser. No. 237,972
Int. Cl. C01b *1/02, 1/18*
U.S. Cl. 423—652 **12 Claims**

Hydrocarbons are converted to a hydrogen-rich gas stream by first producing a carbonaceous catalytic system having long, thin, coil-like carbon fibers, one end of which is attached to a Group VIII, non-noble metal composition, and then contacting the catalytic carbon with steam at a temperature between 800° and 1200° F.

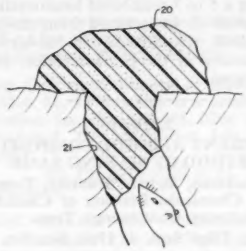
3,816,610

PALATABLE FOAMED RODENT CONTROL MATERIAL

Walter S. Lusby, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of abandoned application Ser. No. 819,140, Apr. 25, 1969. This application Jan. 6, 1972, Ser. No. 215,748
Int. Cl. A01m *1/20;* **A01n** *17/14;* **B27k** *5/00*
U.S. Cl. 424—17 **2 Claims**

A rodent control material comprising a rodent control agent, such as rodenticide, interdispersed throughout a plastic foam cellular structure is made by admixing chemical ingredients capable of forming a solid resinous



cellular mass with a liquid or solid rodenticide in an amount effective to kill rodents.

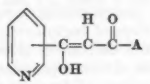
3,816,611

ULTRAVIOLET LIGHT-ABSORBING COMPOSITIONS COMPRISING A 1-(PHENYL OR PYRIDYL)-3-PYRIDYL-1,3-PROPANEDIONE

Hans Eberhardt and Albert Reuter, Biberash an der Riss, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

Filed Feb. 4, 1972, Ser. No. 223,537
Claims priority, application Germany, Feb. 8, 1971, P 21 05 672.4
Int. Cl. A61l *23/00*
U.S. Cl. 424—59 **6 Claims**

Ultraviolet light-absorbing compositions comprising from 0.5 to 20% by weight, based on the total weight, of a compound of the formula



wherein A is pyridyl, phenyl, halo-phenyl, lower alkyl-phenyl or lower alkoxy-phenyl,

or a tautomer thereof; the compositions are useful as cosmetic or dermatological preparations for protecting the skin against ultraviolet light, and also as light-protective impregnating agents for cardboard and similar packaging material.

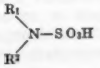
3,816,612

PROCESS FOR THE PRODUCTION OF BASICALLY REACTING PHARMACEUTICALS

Wilhelm Schmidt, Buchschlag, and Herward Schindler, Frankfurt am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Continuation of abandoned application Ser. No. 625,322, Mar. 23, 1967. This application Feb. 10, 1970, Ser. No. 9,120
Int. Cl. A61k *9/00*
U.S. Cl. 424—45 **20 Claims**

A method of forming stable solutions of at least one pharmaceutical substance containing a basically reacting nitrogen atom in pharmaceutically acceptable organic solvent systems, the step of incorporating a solution aid selected from the group consisting of aryl sulfonic acid, lower alkyl substituted aryl sulfonic acids, hydroaromatic sulfonic acids, lower alkyl substituted hydroaromatic sulfonic acid, terpene sulfonic acids, camphor sulfonic acids and sulfuric acid semiamides of the formula



wherein R^1 and R^2 taken individually are hydrogen, lower alkyl, phenyl and phenyl alkyl having 1–5 C atoms in the alkylene group and R^1 and R^2 taken together is a divalent radical forming a 5 to 7 membered heterocyclic ring with the nitrogen atom shown selected from the group consisting of alkylene, aza-alkylene and oxa-alkylene to improve the solubility of the pharmaceutical substance in said solvent system.

3,816,613
ANTI-PERSPIRANT AEROSOL COMPOSITION AND METHOD OF MAKING SAME

Stewart M. Beekman, Signal Mountain, Tenn., assignor to Chattem Chemicals, Division of Chattem Drug & Chemical Company, Chattanooga, Tenn.

No Drawing. Filed Sept. 4, 1968, Ser. No. 757,451

Int. Cl. A61k *7/00*

U.S. Cl. 424—47 **3 Claims**

Stable anti-perspirant compositions suitable for use in aerosols which are non-gelling, substantially non-corrosive, and have reduced stickiness, the compositions including the reaction product between a particular family of chlorhydroxy aluminum complexes, a basic aluminum chloride, and a hydroxylic agent, the reaction being conducted in a medium of absolute ethanol.

3,816,614
HAIR BLEACHING COMPOSITIONS AND PROCESS

Eugene Zeffren and Richard B. Knohl, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Aug. 5, 1971, Ser. No. 169,492

Int. Cl. A61k *7/12*

U.S. Cl. 424—62 **17 Claims**

Hair bleaching compositions containing barbituric acid, certain derivatives of barbituric acid or certain salts of barbituric acid and derivatives thereof, and a peroxygen compound as essenital components, said compositions having a pH in a range of from about 8 to about 11, and hair bleaching process.

3,816,615
HAIR BLEACHING COMPOSITIONS AND PROCESS

Eugene Zeffren and Richard B. Knohl, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Aug. 5, 1971, Ser. No. 169,538

Int. Cl. A61k *7/12*

U.S. Cl. 424—62 **17 Claims**

Hair bleaching compositions containing certain dicarbonyl compounds and a peroxygen compound as essential components, said compositions having a pH in a range of from about 8 to about 11, and hair bleaching process.

3,816,616
UNITARY SHAMPOO AND CREAM RINSE COMPOSITIONS

Robert A. Anguillo, Denville, and Paul Thau, Morristown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Nov. 30, 1971, Ser. No. 203,457

Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **6 Claims**

A shampoo-cream rinse composition is disclosed. This shampoo comprises the combination of O-alkyl-trimethylammoniumchloride substituted a hydroglucose polymer and an anionic detergent in an aqueous solution. This composition is effective as a shampoo as well as the conditioning action of a cream rinse.

ERRATUM

For Class 424—76 see:
Patent No. 3,816,577

3,816,617
METHOD FOR INDUCING MENSES

Upendra K. Banik, Pierrefonds, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 25, 1972, Ser. No. 274,960

Int. Cl. A61k *17/00, 17/06*

U.S. Cl. 424—100 **1 Claim**

There is disclosed herein a method for inducing menses in pregnant primates wherein chorionic gonadotropin or pregnant mares' serum gonadotropin, or mixtures thereof, are administered as a single dose or as a closely spaced divided dose during the period of time from day 14 to day 35 of gestation.

3,816,618
RUMINANT FEED UTILIZATION IMPROVEMENT

Arthur P. Raun, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 15, 1972, Ser. No. 315,721

Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **7 Claims**

Ruminant animals having a developed rumen function and animals which ferment fibrous vegetable matter in the cecum convert their feed more efficiently to energy when orally treated with an antibiotic chosen from among A477, A–4696, vancomycin, and ristocetin and their physiologically-acceptable salts and esters.

3,816,619
LADAKAMYCIN AND PROCESS FOR PREPARING SAME

Malcolm E. Bergy, Ladislav J. Hanka, and Ross R. Herr, Kalamazoo, and Donald J. Mason, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of abandoned application Ser. No. 482,472, Aug. 25, 1965. This application Aug. 30, 1965, Ser. No. 483,723

Int. Cl. A61k *21/00;* **C07d** *51/52*

U.S. Cl. 424—116 **6 Claims**

New antibiotic ladakamycin and a microbiological process for the production thereof using the microorganism *Streptoverticillium ladakanus* var. *ladakanus*. Ladakamycin can be used to inhibit the growth of various bacteria, for example, *Pseudomonas aeruginosa, Proteus vulgaris, Aerobacter aerogenes,* and *Escherichia coli.*

3,816,620
PHOSPHORAMIDATE ESTER INSECTICIDAL COMPOSITIONS

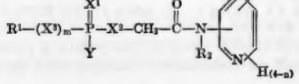
Sidney B. Richter, Chicago, and Leonard J. Stach, Riverside, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Original application Nov. 25, 1968, Ser. No. 778,768, now Patent No. 3,632,814. Divided and this application Feb. 12, 1971, Ser. No. 115,079

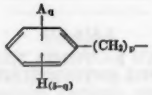
Int. Cl. A01n *9/36*

U.S. Cl. 424—200 **4 Claims**

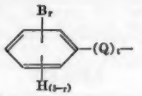
This invention discloses the insecticidal use of compounds of the formula



wherein R^1 is selected from the group consisting of alkyl, alkenyl and



wherein A is selected from the group consisting of alkyl, aklenyl, alkoxy, alkylthio, halogen, nitro, dialkylamino, alkylsulfoxide and alkylsulfone, q is an integer from 0 to 5, and p is an integer from 0 to 3; X^1, X^2 and X^3 are independently selected from the group consisting of oxygen and sulfur; m is an integer from 0 to 1; Y is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, amino, alkylamino, dialkylamino and



wherein B is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, nitro, dialkylamino, alkylsulfoxide and alkylsulfone, r is an integer from 0 to 5, Q is selected from the group consisting of oxygen, sulfur, alkylene, alkyleneoxy and alkylenethio, and t is an integer from 0 to 1; R^2 is alkyl; Z is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen and nitro; and n is an integer from 0 to 4.

3,816,621

USE OF O,O-DI-(C_1–C_2 ALKYL)S-[1-(C_7–C_{20} ACYL) HYDANTOIN-3-YL]METHYL PHOSPHOROTHIOATES AS INSECTICIDES

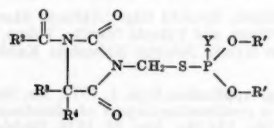
Albert H. Haubein, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Application Oct. 29, 1970, Ser. No. 85,298, now Patent No. 3,687,966, which is a continuation-in-part of abandoned application Ser. No. 694,861, Jan. 2, 1968. Divided and this application Jan. 10, 1972, Ser. No. 216,858

Int. Cl. A01n *9/36*

U.S. Cl. 424—200 **3 Claims**

Disclosed is an insecticidal composition comprising compounds of the formula:



in which R′ is CH_3 or C_2H_5, R^2 is C_1–C_{19} alkyl, R^3 and R^4 are H or CH_3, and Y is O or S and a process for killing insects.

3,816,622

3-PHOSPHORYLTHIO ACRYLAMIDE BIOCIDAL COMPOSITIONS

Horst O. Bayer, Levittown, and William S. Hurt and Harold E. Aller, Norristown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 22,660, Mar. 25, 1970, which is a continuation-in-part of application Ser. No. 807,445, Mar. 14, 1969, both now abandoned. This application July 12, 1971, Ser. No. 162,010

Int. Cl. A01n *9/20, 9/36*

U.S. Cl. 424—211 **7 Claims**

Insecticidal, miticidal and nematocidal compositions containing as the active ingredient 3-phosphorylthio acrylamides of the general formula

$$(R^9O)(R^{10}O)P(O)SCH{=}C(R^{11})C(O)NHR^{12}$$

3,816,623

INSECTICIDAL, MITICIDAL AND NEMATOCIDAL USE OF UNSYMMETRICAL THIO-DITHIOPHOSPHORIC ACID ADDUCTS

Karl Griesbaum, Forchheim, Germany, and Alexis A. Oswald, Mountainside, and Daniel Noyes Hall, Linden, N.J., assignors to Esso Research and Engineering Company

No Drawing. Application Dec. 9, 1968, Ser. No. 782,466, now Patent No. 3,591,475, which is a continuation-in-part of application Ser. No. 368,351, May 18, 1964, now Patent No. 3,449,474. Divided and this application June 1, 1971, Ser. No. 149,030

Int. Cl. A01n *9/36*

U.S. Cl. 424—215 **1 Claim**

Unsymmetrical thiol-allene diadducts [1,3- and 1,2-bis (substituted mercapto)-propanes] are prepared by the free radical and/or ionic addition of a thiol compound to a monoadduct allyl sulfide or through the sequential addition of two different thiol compounds to allene. Superior process selectivity is secured by carefully selecting the thiol reagent to be added to the monoadduct allyl sulfide or by controlling the order of addition of the different thiol reagents to allene. The type of compound that can be added to the monoadduct allyl sulfide and the order of addition of the differing thiols to allene is dictated by the relative hydrogen donor abilities of the thiol reagents. Diadducts containing a dialkyl dithiophosphoric acid constituent and either an alkyl or aryl thiol constituent are effective insecticides, miticides and nematocides.

3,816,624

ANAESTHETIC STEROIDS

Benjamin Davis, Chalfont St. Peter, and Gordon Hanley Phillipps, Greenford, England, assignors to Glaxo Laboratories Limited, Middlesex, England

No Drawing. Continuation-in-part of application Ser. No. 47,163, June 17, 1970, now Patent No. 3,714,352, dated Jan. 30, 1973. This application Dec. 16, 1971, Ser. No. 208,922

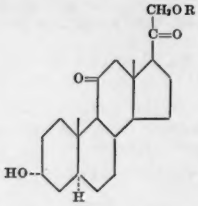
The portion of the term of the patent subsequent to Jan. 30, 1990, has been disclaimed

Int. Cl. A61k *17/00*

U.S. Cl. 424—243 **32 Claims**

As an anaesthetic composition for anaesthetising a subject by parenteral administration, an aqueous solution or

suspension of 3α-hydroxy-5α-pregnane-11,20-dione as principal active ingredient. If the composition is in solution form, it will contain at least 1 mg./ml. of this steroid and at least 1% by weight (10 mg./ml.) of a parenterally acceptable non-ionic surface active agent having an HLB value of from 9–18. The solution also preferably contains to increase the solubility of the 3α-hydroxy - 5α - pregnane - 11,20-dione, at least one steroid of the formula



wherein R is selected from the group consisting of a lower alkanoyl group, a hemisuccinoyl group and a benzoyl group. If the composition is in suspension form it will contain 0.1–2.0% by weight of the principal active steroid, from 0.5–5.0% by weight of a non-ionic surface active agent having an HLB value of at least 9, and, desirably, from 0.1–10% by weight of a suspending agent. The composition may be presented in dosage unit form in a container containing 10 mg.–300 mg. of the principal active steroid.

3,816,625

METHOD FOR LOWERING URIC ACID LEVELS USING 7 - ALKYL-SULFONYL SUBSTITUTED BENZOTHIADIAZINE-1,1-DIOXIDES

Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 22, 1972, Ser. No. 265,132

Int. Cl. A61k *27/00*

U.S. Cl. 424—246 7 Claims

Method for decreasing the concentration of uric acid in the blood and urine of a mammal by the administration of a 7-alkyl(or aralkyl)sulfonyl-1,2,4-benzothiadiazine-1,1-dioxide product. The products employed in this method of treatment are prepared by conventional methods such as oxidizing a 7-alkyl- or aralkylthio substituent to the 7-alkyl- or aralkylsulfonyl group or cyclizing a 4-alkyl- or aralkylthio-orthanilamide by known methods followed by oxidation of the 7-thio to the 7-sulfonyl moiety. The products effect the lowering of the uric acid level by virtue of their xanthine oxidase inhibiting properties.

3,816,626

3-PYRIDYL - 1,2,4 - BENZOTHIADIAZINE-1,1-DIOXIDE FOR LOWERING URIC ACID LEVELS

Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 29, 1972, Ser. No. 267,278

Int. Cl. A61k *27/00*

U.S. Cl. 424—246 15 Claims

Method for decreasing the concentration of uric acid in the blood and urine of a mammal by the administration of a 3-pyridyl-1,2,4-benzothiadiazine-1,1-dioxide product or a 3,4-dihydro derivative. Products employed in this method of treatment are prepared by conventional procedures employing ring closure of the appropriate orthanilamide. The products effect the lowering of the uric acid level by virtue of their xanthine oxidase inhibiting properties.

3,816,627

3-HETEROARYL - 2 - THIO - 1,3-THIAZANE-2,4-DIONES HAVING ANTIARTHRITIC ACTIVITY

Joseph Weinstock, Phoenixville, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Original application Nov. 17, 1971, Ser. No. 199,768, now Patent No. 3,732,216, dated May 8, 1973. Divided and this application Feb. 6, 1973, Ser. No. 330,170

Int. Cl. A61k *27/00*

U.S. Cl. 424—246 8 Claims

3 - Heteroaryl-2-thio-1,3-thiazane-2,4-diones in which the heteroaryl moiety is pyridyl, thiazolyl, thienyl, furyl, pyridazinyl, thiadiazolyl, pyrimidyl or triazinyl and having anti-arthritic activity are generally prepared via ring closure of a β-(thiocarbamylthio) substituted carboxylic acid with acetic anhydride/concentrated sulfuric acid.

3,816,628

4-HYDROXY - 3 - (3-ISOXAZOLOCARBAMYL)-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDES TO TREAT INFLAMMATORY FEVER AND PAIN CONDITIONS

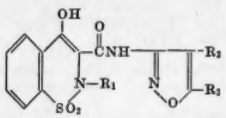
Harold Zinnes, 16 Calumet Ave., White Meadow Lake, Rockaway, N.J. 07866; Martin L. Schwartz, 611 Meyersville Road, Gillette, N.J. 07933; and John Shavel, Jr., Yardley Place, Mendham, N.J. 07945

No Drawing. Original application Mar. 1, 1971, Ser. No. 119,967, now Patent No. 3,787,324. Divided and this application Feb. 20, 1973, Ser. No. 333,821

Int. Cl. A01n *9/00, 9/12*

U.S. Cl. 424—246 1 Claim

Compounds having the following structural formula are disclosed:



I

wherein R_1 is hydrogen or methyl and R_2, and R_3 are hydrogen or alkyl. These compounds are useful as anti-inflammatory agents, antipyretics, analgesics.

3,816,629

2-AMINO-4,6-DIPHENETHYLAMINO-S-TRIAZINE FOR TREATING ARTERIOSCLEROSIS

Tsutomu Irikura, Kyoichi Higo, Akitoshi Maeda, Fumihiko Morinaga, and Takeshi Naruke, Tokyo, Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Application Sept. 1, 1972, Ser. No. 285,680, which is a continuation-in-part of abandoned application Ser. No. 134,394, Apr. 15, 1971. Divided and this application Feb. 12, 1973, Ser. No. 331,861

Int. Cl. A61k *27/00*

U.S. Cl. 424—249 1 Claim

The present invention relates to a valuable medicament for oral administration containing 2-amino-4,6-diphen-

ethylamino-s-triazine as an effective ingredient. The drug of this invention is useful for reducing serum cholesterol level and for preventing arteriosclerosis.

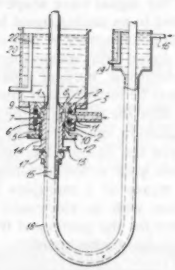
3,816,630
TREATMENT OF SWINE DYSENTERY
Raymond Alexander Bowie and Arthur William James Broome, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Dec. 26, 1972, Ser. No. 318,657
Claims priority, application Great Britain, Feb. 8, 1972, 5,796/72
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 **4 Claims**

The disclosure relates to a method of treating or preventing swine dysentery by administration of quinoxaline 1,4-dioxide.

3,816,631
6-SULFAMOYL - 7 - SUBSTITUTED-4(3H)-QUINAZOLINONES FOR DECREASING URIC ACID CONCENTRATION
Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Oct. 12, 1972, Ser. No. 297,153
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 **5 Claims**

Method for decreasing the concentration of uric acid in the blood and urine of a mammal by the administration of a 6-sulfamoyl-7-substituted-4(3H)-quinazolinone. The products employed in this method of treatment are prepared by conventional procedures such as heating the appropriately substituted anthranilic acid amide or a 2-acyl derivative thereof. The products effect the lowering of the uric acid level by virtue of their xanthine oxidase inhibiting properties.

3,816,632
PREPARATION OF A TUBULAR COLLAGEN CASING
Maxwell Charles Hamlyn, Surrey, and Allan James Kidney and Alexander Owen, London, England, assignors to Lever Brothers Company, New York, N.Y.
Application Mar. 15, 1971, Ser. No. 124,456, which is a continuation of application Ser. No. 743,265, June 7, 1968, both now abandoned. Divided and this application Feb. 12, 1971, Ser. No. 115,133
Int. Cl. A22c *13/00*
U.S. Cl. 99—176 **5 Claims**

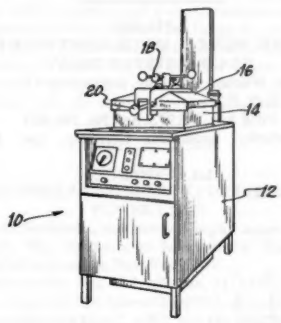


Tubular casing, particularly collagen sausage casing, is produced by extrusion through a nozzle through which a templet or former substantially of the dimensions required in the finished casing is being passed, the casing being received onto the former immediately upon extrusion.

3,816,633
METHOD FOR PRODUCING A COMMERCIALLY STERILE SHELF-STABLE CONTAINERIZED FRIED MEAT PRODUCT
Warren R. Schack, Western Springs, Ill., assignor to Swift & Company, Chicago, Ill.
No Drawing. Filed July 14, 1972, Ser. No. 271,994
Int. Cl. A23b *1/00*
U.S. Cl. 426—407 **10 Claims**

An improved method for preparing a commercially sterile shelf-stable containerized fried meat product which has been packed in containers in the absence of a liquid filler medium is disclosed herein. Meat pieces, such as chicken, fish, beef and the like are first heat-treated to reduce the moisture content therein, fried and immediately packed and sealed under vacuum in containers. The containerized products are then subjected to a critical sequence of heat sterilization steps to achieve commercially acceptable shelf-stable sterility. This critical sequence of steps comprise first subjecting the containerized products to an elevated temperature of between about 190–210° F., such as by a retort process, for approximately 5–15 minutes and then subjecting the products to a higher elevated temperature for a period of time that has been calculated to provide commercial shelf-stable sterility to the product. After cooling and storage at ambient temperatures, the meat pieces exhibit firm, fresh tasting conditions substantially similar to fresh fried meat.

3,816,634
CHICKEN COOKING METHOD
Chester Binks, La Grange, Ill., assignor to Restaurant Technology, Inc.
Continuation-in-part of abandoned application Ser. No. 120,641, Mar. 3, 1971. This application Aug. 30, 1973, Ser. No. 392,940
Int. Cl. A22c *21/00*
U.S. Cl. 426—438 **1 Claim**



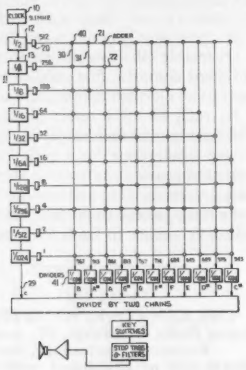
A method for automatically frying chicken is provided. Chicken is placed in a vessel containing heated cooking oil and is sealed therein. A control circuit maintains a first temperature and atmospheric pressure for a first time period and, after the conclusion of the first time period, automatically maintains the oil above a lower temperature level and desirably pressurizes the vessel. After a second time period, the control circuit automatically vents the vessel, signals, and resets. Automatic control is provided alternatively for full or partial loads, to prevent overcooking of partial loads, and to assure the proper cooking of full loads.

ELECTRICAL

3,816,635
SINGLE MASTER TONE GENERATOR

Dale M. Uetrecht, Colerain Twp., Hamilton County, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed May 28, 1971, Ser. No. 147,976
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **10 Claims**

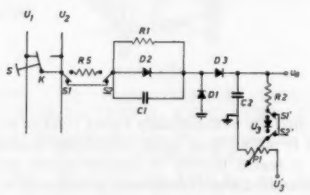


An electronic organ in which all the tones of the musical gamut are obtained by operations on the output of a single tone signal source, utilizing digital techniques to divide the frequency of the tone signal by appropriate integers.

3,816,636
ELECTRONIC MUSICAL INSTRUMENT WITH PLURAL RC CIRCUITS FOR DECAY

Gunter Peltz, Wasser, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 5, 1973, Ser. No. 348,451
Claims priority, application Germany, Apr. 22, 1972, 2219800
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.1 **9 Claims**

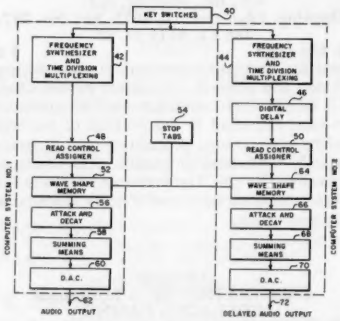


An electronic circuit is disclosed to produce an output voltage which controls the volume of a note produced by a struck key as determined by the velocity with which the key is struck. The electronic circuit includes a changeover switch, changing between two predetermined voltages, coupled to each key of the musical instrument keyboard. The wiper of the switch is connected to ground by a series circuit including a parallel RC network and the cathode-to-anode path of a first diode. A second diode is connected in parallel with the RC network with its cathode being connected to the cathode of the first diode and the output voltage is taken off the cathode of the first diode by the anode-to-cathode path of a third diode. The cathode of this third diode is connected by a second capacitor to ground and is also subjected to an adjustable control voltage.

3,816,637
ELECTRONIC MUSICAL INSTRUMENT WITH DIGITAL REVERBERATION SYSTEM

J. Thomas Whitefield, Harleysville, Pa., assignor to Allen Organ Company, Macungie, Pa.

Filed July 7, 1972, Ser. No. 269,676
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 **6 Claims**



An electronic musical instrument with a digital reverberation system in which one of the digital signals in a pair of digital signal information channels is delayed. The system is particularly adapted for use in an electronic musical instrument in which a digital multiplex signal is generated by actuation of the keys of the instrument. The digital multiplex signal is used to address a digital wave shape memory which stores signals representative of a musical note in digital form. The signals read out of the digital wave shape memory are, after processing, converted to an analog signal by means of one or more digital to analog converters. A pair of digital channels, one of which has a digital delay means therein, may be incorporated into an electronic musical instrument at various stages. The delay may be incorporated into one of the digital channels before or after the reading of the digital wave shape from memory. In addition, means may be provided to selectively switch between the delayed and undelayed signals as desired for the pedals, great or lower manual, and the swell or upper manual by means of a multiplex keyboard selector which in conjunction with an electronic switch selectively switches in the delay for the portion of the multiplex signal corresponding to a particular keyboard.

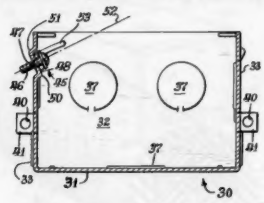
3,816,638
ELECTRICAL BOX GROUND SCREW MOUNTING

Arthur I. Appleton, c/o Appleton Electric Company, 1701 W. Wellington, Chicago, Ill. 60657

Filed July 3, 1972, Ser. No. 268,695
Int. Cl. H02g *3/08*
U.S. Cl. 174—51 **2 Claims**

In an electrical box having a hole in one side for receiving a ground screw, the portion of the wall immediately surrounding

the ground screw hole is formed to entrap a ground wire placed under the ground screw so that the ground wire cannot



escape from under the head of the ground screw as the ground screw is tightened down thereon.

3,816,639

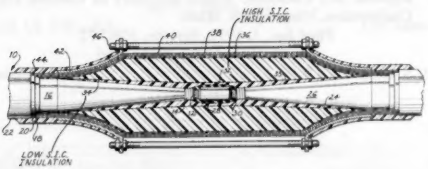
HIGH VOLTAGE CABLE SPLICE WITH GRADED INSULATION AND METHOD OF MAKING SAME

Harry Christen Anderson, Stratford, and Burton Thornley MacKenzie, Jr., Monroe, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 14, 1973, Ser. No. 359,986

Int. Cl. H02g *15/08, 1/14*

U.S. Cl. 174—73 R **16 Claims**



An electrically insulated cable splice of reduced mass and increased service reliability for conductively connecting high voltage insulated electrical cable comprising a central current carrying conductor surrounded by electrically insulating material, and the method of forming same. The splice construction comprises a combination of materials of different specific inductive capacitances, the symmetrically counterposed relation of components to control electrical stresses, and physical restraints to inhibit movement of the materials comprising the splice.

3,816,640

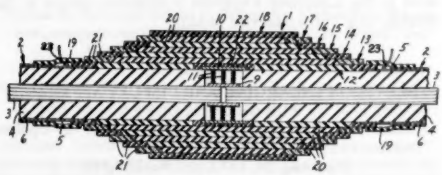
MULTITUBE CABLE SPLICE ASSEMBLY AND METHOD OF MAKING SAME

Wayne F. Varner, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 12, 1973, Ser. No. 378,576

Int. Cl. H02g *15/08, 1/14*

U.S. Cl. 174—73 R **8 Claims**



A cable splice assembly employed for joining a pair of shielded high voltage cables is formed from a number of elastomeric, coaxial inner tubes and an elastomeric, semiconductive outer tube that is coaxial with the inner tubes. Semiconducting portions and high dielectric strength insulating portions form the inner tubes with the semiconducting portions of adjacent inner tubes interleaved to serve as extensions of the cable shielding. At least one of the shield extensions electrically contacts the semiconductive outer tube to extend the cable shielding over the splice region.

3,816,641

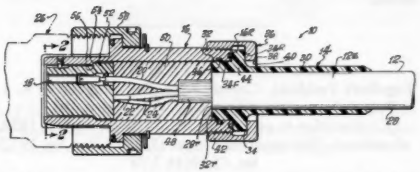
UNDERWATER CONNECTOR AND METHOD OF MAKING SAME

Ralph T. Iversen, Granada Hills, Calif., assignor to Viking Industries Inc., Chatsworth, Calif.

Filed May 14, 1973, Ser. No. 359,911

Int. Cl. H01r *13/36, 11/02, 17/04*

U.S. Cl. 174—76 **8 Claims**



An underwater connector for communication cables, which can be readily installed in the field and which provides long term high reliability at great undersea depths. The connector includes a tubular preform of the same thermoplastic material as the sheath of the cable and which is heat-bonded to the cable so that the materials of the preform and cable sheath merge. The preform has a flange near its forward end which is installed facewise against the rear end of a metal shell into which the cable extends, and a cap threaded onto the shell presses against the rear face of the flange to lock it in place against the shell. The conductors of the cable extend through a hard member which abuts the extreme forward ends of the preform and cable sheath to prevent either of them from being forced further into the shell under the high underwater pressures.

3,816,642

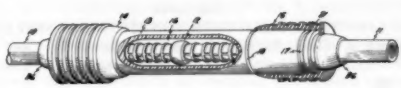
FLEXIBLE INSULATING SHEATH FOR DIRECT BURIED POWER LINES

John August Toedtman, and James Joseph Cooper, Jr., both of St. Louis, Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. Nos. 110,308, Jan. 21, 1971, abandoned, and Ser. No. 810,729, March 26, 1969, abandoned. This application June 7, 1972, Ser. No. 260,406

Int. Cl. H02g *15/08*

U.S. Cl. 174—138 F **4 Claims**



A substantially cylindrical or tubular insulating sheath provides a waterproof protection for a splice or connection

between electrical power distribution conductors. An internal rib and shoulder configuration cooperates with the spliced conductors to seal each end of the sheath. The construction is

arranged to increase the sealing forces acting upon the sheath responsive to increased pressure either inside or outside the sheath.

3,816,643

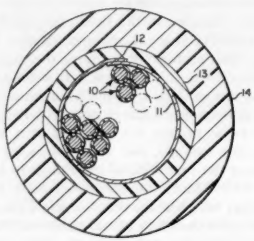
ELECTRICAL CABLE AND PROCESS

Engelbert Pechhold, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 241,240, April 5, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 397,719

Int. Cl. H01b *7/18*

U.S. Cl. 174—107 **15 Claims**



An electrical cable which can be made by the tandem extrusion process is provided. The electrical cable comprises (1) a core of an electrical conductor, (2) an aluminum shield surrounding the conductor, at least the outer surface treated with a soluble azo compound cross-linking agent for polyethylene and a complex of fumarato chromic (III) nitrate, (3) a layer of a polyolefin having a density within the range of 0.910 to 0.935 surrounding and adhered to the treated surface of the aluminum shield, and polyolefin being polyethylene or a copolymer of ethylene with at least one α-olefin having three to eight carbon atoms (4) an outer jacket of polyethylene containing carbon black surrounding and adhered to the polyolefin layer.

3,816,644

LOW NOISE CORD WITH NON-METALLIC SHIELD

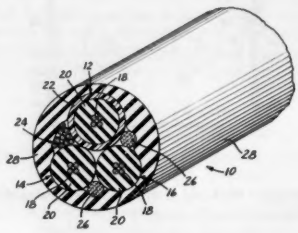
Byron B. Giffel, Richmond, Ind., and Robert B. Cole, New Westville, Ohio, assignors to Belden Corporation, Chicago, Ill.

Filed Mar. 30, 1973, Ser. No. 346,600

Int. Cl. H01b *9/02*

U.S. Cl. 174—115 **9 Claims**

A low noise flexible multiconductor electric cord having a number of insulated electrical conductors, at least one of which has a non-metallic electrically conductive material enveloping the same to define an electrical shield, a grouping of relatively small exposed electrical drain or ground strands positioned generally parallel to and in intimate contact with



the shield of each of the shielded primary conductors to provide electrical continuity between the grounding strands and the shielding material, and an outer insulating jacket enveloping all of the conductors and ground strands.

3,816,645

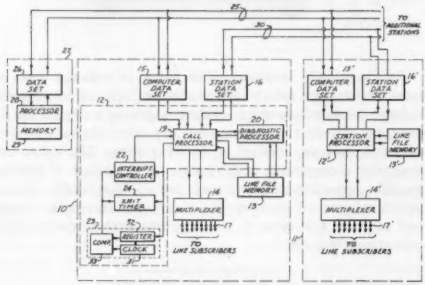
COMMUNICATIONS SYSTEM

William G. E. Ehrich, Conches, Switzerland, and Jackson D. Bigham, Jr., Lakeville, Minn., assignors to Control DAta Corporation, Minneapolis, Minn.

Filed Jan. 3, 1973, Ser. No. 320,772

Int. Cl. H04l *15/00*; **H04q** *1/00*

U.S. Cl. 178—2 R **19 Claims**



A processor substation for a communication system includes interrupt circuitry for transmitting coded communications as logic levels, rather than fixed length bits, so that communications can be handled at various code speeds and bit lengths. A message to be received by a subscriber is processed by an interrupt means in the substation to change the signal level to the subscriber whenever a transition occurs in the message (e.g. 1 to 0, and vice versa).

3,816,646

TELEVISION ENLARGING AND DISPLAY APPARATUS FOR GRAPHIC COPY

Alphonse P. Cinque, Lynbrook, N.Y., assignor to Opaque Systems, Ltd., Hempstead, N.Y.

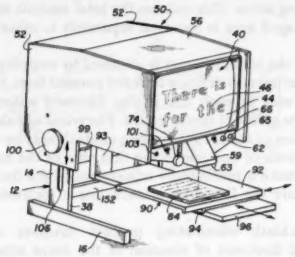
Filed Aug. 24, 1972, Ser. No. 283,580

Int. Cl. H04n *7/18*

U.S. Cl. 178—6 **10 Claims**

An optical enlarging apparatus for graphic copy includes a

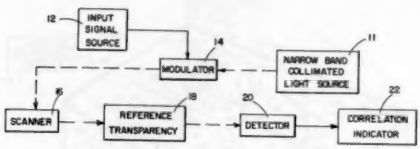
table for supporting the copy, and a stand carrying a television camera, a television mirror in the optical path between the camera and copy.



3,816,647
OPTICAL CORRELATION OF SCANNED REAL-TIME SIGNALS

Milton M. T. Chang, Fountain Valley, and John T. McCrickerd, Hawthorne, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 5, 1972, Ser. No. 241,317
Int. Cl. H04n *3/00*
U.S. Cl. 178—6.8 **13 Claims**



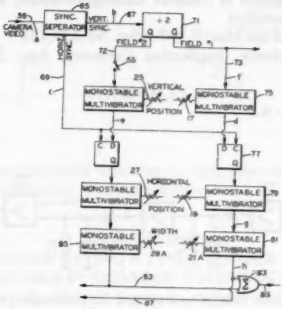
A light beam is generated by means of a narrow band collimated light source, and this light beam is modulated in accordance with an electrical input signal to be identified. The light beam is then optically scanned at a predetermined scanning rate to produce an optical image of the input signals against a time base. Light from this optical image is passed through a holographic reference transparency, which is a spatial filter corresponding to the Fourier transform of the image of known electrical signals, the light passing through the transparency being fed to a detector. Successive reference transparencies are utilized until correlation between the transparency and the input signal to be identified is indicated by a peaking of the detector output which is sensed by a correlation indicator.

3,816,648
SCENE INTRUSION ALARM

Thomas K. Noll, and Robert E. Billingsley, both of Fort Wayne, Ind., assignors to The Magnavox Company, Ft. Wayne, Ind.

Filed Mar. 13, 1972, Ser. No. 234,165
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **16 Claims**

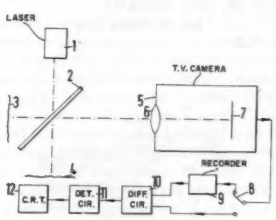
A video motion detector is disclosed for use in conjunction with one or more closed circuit television cameras and a video monitor, recorder or other closed circuit television surveillance equipment. The video motion detector monitors selectable portions of a scene and provides an alarm indication in response to detected motion in those selected portions of the scene. The system uses the synchronization signals from the camera, retimes those signals, and uses them to gate video information into a processor which integrates the selected portion of the scene, compares this integral with a specified previously stored integral and provides an output alarm if the comparison difference exceeds a predetermined value.



3,816,649
OPTICAL INSPECTION

John Neil Butters, Woodthrope, and Jack Albert Leendertz, Loughborough, both of England, assignors to National Research Development Corporation, London, England

Filed June 19, 1972, Ser. No. 264,007
Claims priority, application Great Britain, June 22, 1971, 29213/71
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **27 Claims**

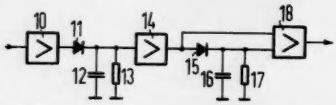


An inspection system employing television techniques makes use of coherent optical phenomena. A comparison is made between two video signals each resulting from irradiation of a photosensitive screen with coherent light consisting of two interfering beams, the light of one beam having been scattered from a surface to be inspected and imaged on the screen. In studying deformation of a surface, the two signals are derived with the surface in different states. In comparing two similar surfaces, the two signals may be derived using light of different wavelengths, the two interfering beams consisting of light scattered respectively from the two surfaces.

3,816,650
SENSING MINOR BRIGHTNESS DIFFERENCES IN THE TELEVISION IMAGE IN A SYSTEM FOR ZONE-MELTING OF A SEMICONDUCTOR

Heinz Drax, Munich, and Hans Stut, Groebenzell, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 9, 1973, Ser. No. 339,724
Claims priority, application Germany, Apr. 27, 1972, 2220819
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **5 Claims**

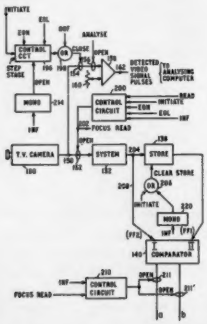


This invention relates to a system for controlling the diameter of the semiconductor rod at the solidification front of the molten zone, and more particularly to such a system wherein the image of the molten zone is recorded by a television camera and is scanned line by line by an electron beam, and wherein a number of pulses is produced by a gating arrangement during the time at which the image of the semiconductor rod is scanned. The number of these pulses is proportional to the diameter of the semiconductor rod. Means is used which automaticly produces a triggering pulse due to the sudden change of the radiation intensity when the solidification front is traversed by the scanning beam. The first mentioned pulses are stored line by line and the time of the triggering pulse compared with a programmed desired value of the diameter of the semiconductor rod so that the resulting deviation controls a push-pull arrangement with respect to the programming of the diameter of the semiconductor rod.

3,816,651
AUTOMATED IMAGE ANALYSIS EMPLOYING AUTOMATIC FOCUSSING

Gerald Marvin Gardner, Saffron Walden, England, assignor to Image Analysing Computers Limited, Hertfordshire, England

Filed Sept. 22, 1972, Ser. No. 291,179
Claims priority, application Great Britain, Sept. 22, 1971, 44132/71; June 28, 1972, 30278/72
Int. Cl. H04n *5/34*
U.S. Cl. 178—7.2 **13 Claims**



In a method of analysis which involves the formation of an image of each of a series of different areas of a specimen on the photocathode of a television camera tube for scanning in known manner by an electron beam to produce a video signal of each area for analysis, the image of each nth area is automatically focussed and the focus setting is maintained for the intervening areas. This reduces the total analysis time which if every imaged area is focussed separately is otherwise excessive.

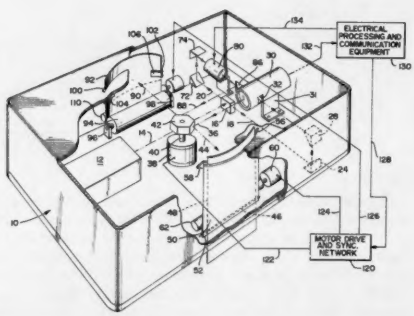
Where the series of areas is obtained by stepping movement of the specimen to define a series of parallel lines, the image of the first area in each line is also focussed automatically to reduce the effect of specimen tilt. Electrical signals describing the position of the focus adjusting controls may be stored from the first area of one line to the first area of the next line and used to make a preliminary adjustment of the focussing controls before the first area of each line is focussed automatically.

A backlash eliminating process involves selecting a preferred direction of reaction of the focus adjusting drive motor and the automatic generation of two motor current pulses in succession when movement in the non-preferred direction is required, the first pulse producing an excess movement in the non-preferred direction and the second producing a smaller movement in the preferred direction so that the next displacement is in the non-preferred direction.

3,816,652
LASER FACSIMILE TRANSCEIVER

George D. Barnett, Quarters 383D, MCB,, Quantico, Va. 22134

Filed July 26, 1971, Ser. No. 165,906
Int. Cl. H04n *1/04*
U.S. Cl. 178—7.6 **2 Claims**



A facsimile transceiver in which a beam of coherent radiation, as from a laser, is split into two separate parallel beams which are angularly directed against two sides of a single polygonal rotating mirror such that two divergent scanning beams are produced for reading a send document and printing a receiving document, singly or simultaneously.

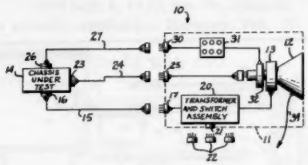
3,816,653
TELEVISION TEST APPARATUS

J. Warren Bosiger, Minneapolis, Minn., assignor to Colonial Merchandising Corporation, Seneca Falls, N.Y.

Filed Dec. 13, 1972, Ser. No. 314,814
Int. Cl. G01r *31/28;* **H01r** *31/08*
U.S. Cl. 178—7.9 **9 Claims**

Television test apparatus for testing television chassis is shown. The test apparatus incorporates a cathode ray tube and deflection components therefor together with coupling apparatus for coupling the deflection signals from the chassis under test to the yoke in the test apparatus. The coupling apparatus includes an impedance transformer such as an au-

totransformer and switch or jumper modules for connecting the horizontal deflection windings of the yoke in either series



or parallel and to the autotransformer for providing proper impedances to the chassis under test.

3,816,654

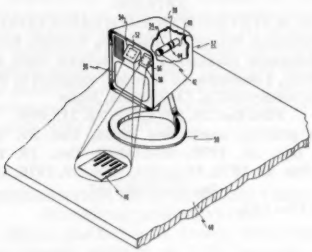
SOLID STATE CAMERA TUBE EMBODYING A FIXED IRIS

Barrie Brightman, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 2, 1972, Ser. No. 249,594

Int. Cl. H04n *5/26, 5/30*

U.S. Cl. 178—7.2 **5 Claims**



A solid state camera tube is provided with an optical filter which acts as a fixed iris. A solid state photoconducting target activated by the infrared light is provided in the camera tube. A light source comprising an array of infrared light emitting diodes is employed with the camera tube to illuminate the image. The camera tube and the light source is combined to provide apparatus for surveillance, or in combination with a display, for suitable use in an audio-video telephone system.

3,816,655

OPTICAL DEVICE FOR TELECINE SYSTEMS

Michel Favreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 3, 1972, Ser. No. 294,514

Claims priority, application France, Oct. 29, 1971, 71.39038

Int. Cl. G02b *27/10;* **H04n** *5/84*

U.S. Cl. 178—7.88 **3 Claims**

In a twin-path optical device a telecine system carrying out interlaced scanning by means of a flying spot scanning tube, the two paths, defined for example by means of fixed mirrors respectively terminate on the two opposite faces of one and the same sector of a rotary mirror with alternate reflecting and transparent sectors.

Two images of the scanned field described by the light spot of the tube are alternately obtained, by means of a single pro-

jecting lens alternately receiving the light transmitted by, and the light reflected by, the rotary mirror.

3,816,656

TELEPRINTER HAVING A TYPE CYLINDER WHICH IS ADJUSTABLE BY MEANS OF A STEPPING MOTOR

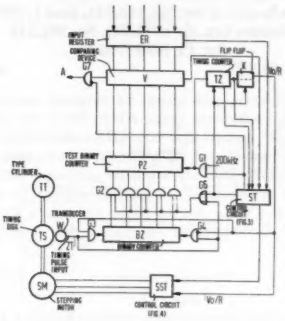
Martin Ludwig, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 31, 1972, Ser. No. 302,569

Claims priority, application Germany, Nov. 4, 1971, 2154899

Int. Cl. H04l *15/34*

U.S. Cl. 178—34 **2 Claims**



A teleprinter for *n*-step codes having a type cylinder which can be adjusted by a stepping motor by means of rotating the type cylinder in both directions comprises a position comparing device and an *n*-digit electronic binary counter for counting marks arranged in a row at the circumference of a timing disk carried for rotation with the type cylinder. The position of the timing disk is compared electronically with the received code combination associated with the type to be positioned and the type carrier is operated to the next circumferential position in accordance with the lesser distance of travel in the advance or reset direction of rotation of the type carrier.

3,816,657

DIFFERENTIAL PHASE-SHIFT-KEYED COMMUNICATION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Philip M. Hopkins, 818 Wavecrest Ln., Houston, Tex. 77058, and Wally M. Wallingford, 89 Bayou Ln. Rt. 1, Kemah, Tex. 77565

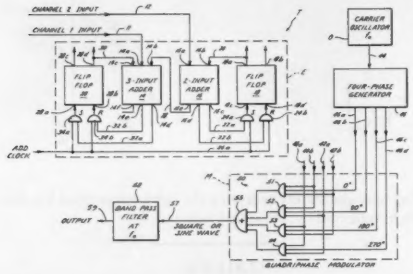
Filed Oct. 12, 1972, Ser. No. 297,128

Int. Cl. H04l *27/24*

U.S. Cl. 178—67 **7 Claims**

A communication system using differential phase-shift-keying (DPSK) transmits and receives binary data without requir-

ing timing or phase reference signals. The system encodes and modulates the data at the transmitter, and decodes and



demodulates the data at the receiver, without ambiguity as to the data content.

3,816,658

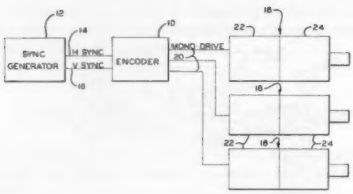
APPARATUS FOR PROVIDING SYNC PULSES ON A SINGLE CONDUCTOR TO A PLURALITY OF TELEVISION CAMERAS

Nikola V. Vidovic, Sunnyvale, Calif., assignor to The Singer Company, Binghamton, N.Y.

Continuation-in-part of Ser. No. 148,731, June 1, 1971. This application Oct. 31, 1972, Ser. No. 302,531

Int. Cl. H04I 7/00

U.S. Cl. 178—69.5 TV **4 Claims**



Horizontal and vertical sync pulses synchronized to a central sync generator are provided to a plurality of TV cameras through respective single cables. In response to horizontal and vertical sync pulses provided by the sync generator, an encoder circuit provides encoded pulses on one end of the cables. A plurality of decoder circuits respectively connected to each of the other ends decodes the encoded pulses and provides the synchronized horizontal and vertical sync pulses to the cameras. In the absence of the encoded pulses, unsynchronized sync pulses are automatically provided by the decoder circuits.

3,816,659

SCANNING APPARATUS

Robert M. Landsman, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

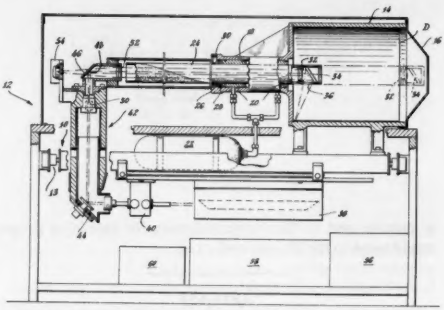
Filed Oct. 13, 1972, Ser. No. 297,255

Int. Cl. H04n 3/00

U.S. Cl. 178—7.6 **11 Claims**

A simplified scanner for facsimile transmission. A cylindrical member supports the material to be scanned and a tubular member extends concentrically into the cylinder. A laser beam passes through the tubular member and is focused to a spot on the inner surface of the cylinder. Either the tubular member or the cylinder is caused to rotate about, and translate along, their common axis with the aid of air bearings. In this manner, spiral scanning is effected with only one moving member.

The foregoing abstract is not to be taken either as a complete exposition or as a limitation of the present invention.



In order to understand the full nature and extent of the technical disclosure of this application, reference must be had to the following detailed description and the accompanying drawings as well as to the claims.

3,816,660

SPEECH SYNTHESIZER WITH GLIDE CONTROL

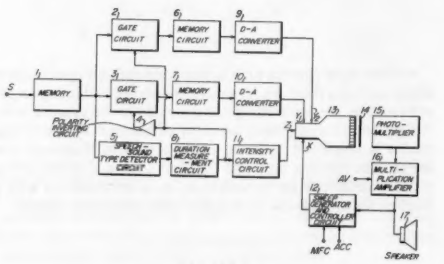
Akira Nishiyama, Neyagawa; Hirokazu Yoshino, Katano; Tetsuo Yamaguchi, Hirakata; Eiichi Tsuboka, Nara, and Haruki Ohwaki, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1971, Ser. No. 213,079

Claims priority, application Japan, Dec. 29, 1970, 45-124824; Dec. 29, 1970, 45-124839; Dec. 29, 1970, 45-124841; Dec. 29, 1970, 45-124842; Dec. 29, 1970, 45-124843

Int. Cl. G10l 1/00

U.S. Cl. 179—1 SA **9 Claims**



A film plate with a series of signal patterns representative of successions of individual speech-sound wave units stored thereon is disposed in front of a cathode ray tube having an optical fiber face plate. By appropriately controlling the scanning system of the cathode ray tube, the scanning beam is directed to the pattern of a signal representing the speech-sound wave unit on the film plate which is required to be read out. The intensity of the electron beam itself is controlled in such a manner as to smooth the glide portion between adjacent speech sounds. The corresponding speech sound is reproduced by detecting the signal for the desired speech sound by a photosensor disposed near the film plate.

3,816,661
TONE CONTROL UTILIZING AN OPERATIONAL AMPLIFIER WITH DIFFERENTIAL INPUTS

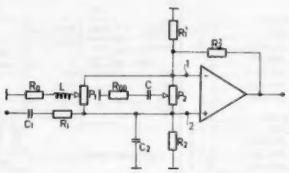
Denes Huszty, and Karoly Szabados, both of Budapest, Hungary, assignors to Elektroakusztikai Gyar, Budapest, Hungary

Filed Sept. 6, 1972, Ser. No. 286,680

Claims priority, application Hungary, Feb. 15, 1972, EE 2004

Int. Cl. H04r *3/00*

U.S. Cl. 179—1 D **9 Claims**



A tone control circuit of a design simpler and more effective than that of those hitherto known, built up of an operational amplifier with differential input, which at the low and/or high tones and/or over a single section, or several, of the audio frequency band permits a transmission characteristic departing from the straight line which in a manner differing from similar known methods guarantees the monotonous decay of the transmission characteristic on the edges of the audio frequency band.

Unlike conventional solutions, monotonous decay is achieved by inserting in series with a reactance connected between the slide and the earth point of the potentiometer connected between the inverting and non-inverting points of the operational amplifier an ohmic resistance, whereas according to need a differentiating or integrating RC circuit is connected between the controlling signal source and the non-inverting point, as the case may be.

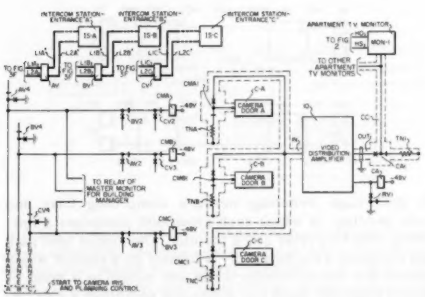
3,816,662
COMBINATION TELEPHONE AND VIDEO COMMUNICATION SYSTEM

David M. Shaver, and Delbert A. Russell, both of Brockville, Ontario, Canada, assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 13, 1972, Ser. No. 306,107

Int. Cl. H04m *11/08*

U.S. Cl. 179—2 TV **14 Claims**


INTERCOM STATION ENTRANCE 'A'
INTERCOM STATION ENTRANCE 'B'
INTERCOM STATION ENTRANCE 'C'
APARTMENT TV MONITOR
TO FIG 2
TO OTHER APARTMENT TV MONITORS
CAMERA DOOR A
CAMERA DOOR B
CAMERA DOOR C
VIDEO DISTRIBUTION AMPLIFIER
TO RELAY OF MASTER MONITOR FOR BUILDING MANAGER
START TO CAMERA (S) AND FILAMENT CONTROL

A door intercom and entrance control system with video facility in which use is made of the telephone line of the desired resident to selectively enable the TV monitor in the called resident's apartment. All TV monitors are served by a coaxial cable terminating in a TV camera at the building entrance, in common. The enabling signal is in the form of a burst of above-speechband frequency which is transmitted, incident to a call from the entrance, ahead of the first splash of ringing frequency or call-waiting tone, as the case may be. Upon cessation of the enabling signal the signal receiver at the apartment end locks to the video received over the coaxial cable. A guard circuit is provided to prevent false triggering of the TV monitor due to spurious signals received over the telephone line.

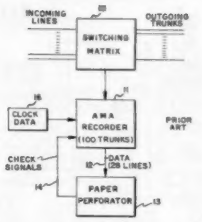
3,816,663
REAL-TIME MULTIPLEXED DIGITAL DATA RECORDING SYSTEM FOR TELEPHONE CENTRAL OFFICE AMA RECORDERS

Paul E. Goodale, Pleasant Hill, Calif., assignor to E-H Research Laboratories, Inc., Oakland, Calif.

Filed Nov. 2, 1972, Ser. No. 303,196

Int. Cl. H04m *15/04*

U.S. Cl. 179—7 MM **14 Claims**



A real-time multiplexed digital data recording system for replacing one to ten AMA paper perforators of a telephone central office with a magnetic tape system. The system provides a deskewing technique for interfacing with the electromagnetic actuating pulses of the AMA recorder and also provides for reverse reading of the magnetic tape to detect disconnect characters while at the same time maintaining compatability with a standard multi-channel magnetic tape reader.

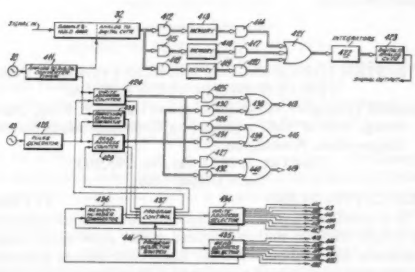
3,816,664
SIGNAL COMPRESSION AND EXPANSION APPARATUS WITH MEANS FOR PRESERVING OR VARYING PITCH

Richard F. Koch, 67 Smith St., Lynbrook, N.Y. 11563

Filed Sept. 28, 1971, Ser. No. 184,371

Int. Cl. H04b *1/66*

U.S. Cl. 179—15.55 T **30 Claims**



Apparatus for compressing, expanding and reading out audio and other signals while preserving or varying their pitch. The apparatus includes means for discarding segments of the signals and compressing the undiscarded segments or, when

desired, repeating certain portions of segments as the signals are being read out to reproduce the signals. The apparatus may also include means for converting the signals into word organized digital signals, storing and reading out the digital signals while discarding or repeating certain segments thereof without losing information content, means for interlacing the reading and writing operations, means for varying the write-in rate and means for varying the read-out rate of the signals so as to control the overall rate and pitch of the output.

3,816,665

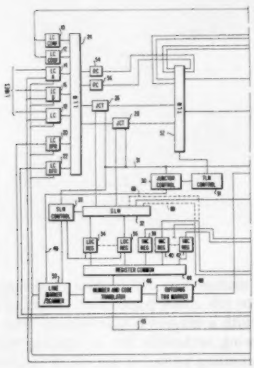
OPERATOR LOOP COMPLEX

Stanley L. Russell, West Webster; Klaus Gueldenpfenning, Penfield, and Uwe A. Pommerening, Webster, all of N.Y., assignors to Stromberg - Carlson Corporation, Rochester, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,752

Int. Cl. H04m *3/00*

U.S. Cl. 179—18 AD **7 Claims**



An operator loop complex for use in a private automatic branch exchange for connecting any one of a plurality of trunks to any one of a plurality of operator consoles via a switching network comprises a position circuit for each console and a plurality of loop circuits associated with each position circuit whereby each connection to a console is made through a position circuit and one of the loop circuits associated therewith under a common control arrangement which enables only one loop circuit to be connected to a trunk at any one time in response to an operator service request from the trunk and whereafter the loop circuit may remain connected to the trunk while being disconnected from the position circuit.

3,816,666

SYSTEM FOR CHANGING THE BURST FORMAT IN A TDMA COMMUNICATION SYSTEM

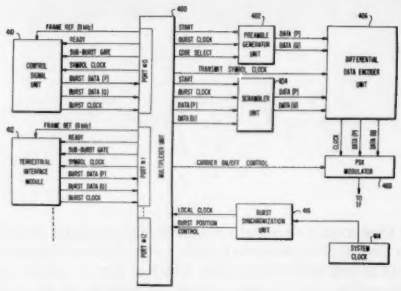
Atsushi Tomozawa, Gaithersburg, and Harold E. Ford, Clarksburg, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Oct. 2, 1972, Ser. No. 293,903

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **17 Claims**

In a satellite transponder communication system operating in a time division multiple access mode, each earth station transmits data in a burst format. Each earth station apparatus is arranged in modular form enabling many forms of data to be included within a station's burst of transmission. Individual terrestrial interface modules receive data, voice, etc. in various forms and convert the data, voice, etc. into bit format suitable for inclusion in the transmitted burst. A multiplexer at the transmitter is controlled by a programmable memory to select and determine the order in which bits are extracted from the various terrestrial interface modules and entered into the bit stream of the transmitted burst. The receiver includes a demultiplexer controlled by a programmable memory to properly demultiplex the bit stream of the received burst and to direct the demultiplexed blocks of bits to respective ones of the terrestrial interface modules. The memories are provided with at least two sections to enable a change in burst format



without loss of communications. At the multiplexer one section controls the format while a new program is written into the other section. A similar arrangement is provided at the receiver. A memory status signal is included in the station's burst and this status is detected by the receive stations. When the multiplexer memory is to be switched from one section to another the status signal changes. The status signal is transmitted as part of the signalling portion of the burst preamble.

3,816,667

SWITCHING NETWORK FOR A TELECOMMUNICATION EXCHANGE

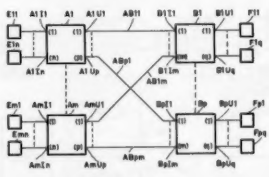
Jan Hendrik Harmanus Limburg, and Henri Peter Johannes Grubben, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 12, 1972, Ser. No. 271,080

Claims priority, application Netherlands, July 22, 1971, 7110075

Int. Cl. H04q *3/48*

U.S. Cl. 179—18 GE **6 Claims**



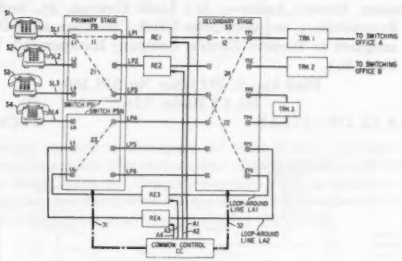
A multi-stage switching network comprising links and matrix switches, in which each crosspoint comprises a one-winding switching relay and a rectifier. The output hold path of an energized switching relay is formed by a resistor which connects the control conductor of the output to a point of constant potential. Each link conductor comprises a gate circuit for testing the states of the output of the preceding and the input of the subsequent switching stage. A path is released by short-circuiting the switching relays via the output marking networks. Connected to the input marking multiples and the input marking points are detectors for testing the various procedures (marking, searching, tracing back, releasing).

3,816,668

ARRANGEMENT FOR PROVIDING SWITCHED RANGE EXTENSION

Kenneth Frank Giesken, Westerville, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 15, 1972, Ser. No. 306,604
Int. Cl. H04m 3/00
U.S. Cl. 179—18 EA 5 Claims



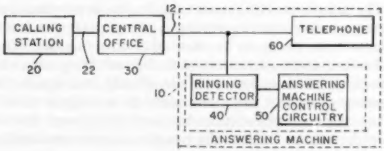
An arrangement is disclosed in a multistage switching system for providing range extension to lines exceeding a predetermined length. Range extension circuitry is included in some of the interstage links accessible to "long lines" as well as in loop-around lines having dual appearances in the switching system. As a first choice, a network connection is established to a "long line" via one of the idle interstage links equipped with range extension circuitry. However, if an idle network connection cannot be found via one of these equipped links, as a second choice the connection is established via a loop-around line adapted to provide range extension.

3,816,669

APPARATUS FOR DETECTING TELEPHONE RINGING SIGNALS

Kalju Meri, Maspeth, N.Y., assignor to Electrospace Corporation, Bronx, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,868
Int. Cl. H04m 1/64
U.S. Cl. 179—84 R 20 Claims



A ringing signal detector connectable to telephone lines and to an answering machine control circuit has a tuned transformer filter which has a center frequency and a bandwidth selected to pass 20 Hertz ringing signals on the telephone lines to the control circuit while substantially preventing the passage of lower frequency 10 Hertz revert dialing signals. The transformer has a floating primary having two input terminals each of which is connected to a series connected resistor-capacitor combination. A neon lamp extends between the two terminals from points intermediate the resistors and capacitors.

3,816,670

LINE CARD CIRCUIT FOR A KEY TELEPHONE SYSTEM

Richard A. Marshall, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 26, 1972, Ser. No. 318,143
Int. Cl. H04m 1/00
U.S. Cl. 179—99 4 Claims

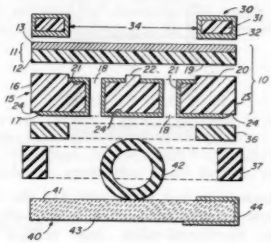
A line card circuit for a key telephone system in which means are provided for sensing ringing current on the line conductors the card is connected to. Also included are means to connect audible and visual signal equipment and to effect placement of the connected line in a hold condition.

3,816,671

ELECTRET TRANSDUCER CARTRIDGE AND CASE

Freeman W. Fraim, Lexington, and Preston V. Murphy, Weston, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 6, 1972, Ser. No. 241,580
Int. Cl. H04r 19/04
U.S. Cl. 179—111 E 11 Claims



An electret microphone is made of a cartridge subassembly including an electret diaphragm fastened to an apertured backplate having diaphragm support means and air vent means for balancing static pressure on both sides of the diaphragm as unitary parts of the plate. This subassembly is held in a housing between a diaphragm contact ring that grounds the metal diaphragm component to the housing and a resilient compression ring that bears on the back plate and the air vent is totally within the housing. The front of the housing has one of several enclosures over the diaphragm for frequency response varying from the voice range to the high fidelity range. A back closure plate, bounding the compression chamber, carries a solid-state preamplifier and a ring-shaped resilient conductor that makes rolling contact with the backplate electrode of the cartridge.

3,816,672

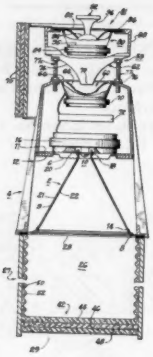
SOUND REPRODUCTION SYSTEM

Herbert Gefvert, 19 Warwick Rd., Winnetka, Ill. 60093, and Keith Peter, 1200 Valley Rd., Deerfield, Ill. 60015

Continuation of Ser. No. 52,590, July 6, 1970, abandoned.
This application Jan. 15, 1973, Ser. No. 323,574
Int. Cl. H04r 9/06
U.S. Cl. 179—115.5 R 20 Claims

A sound system for reproducing the full frequency spectrum of recorded sound throughout a listening environment at its natural volume and in the same spatial relationships as the originally created sound includes a multidirectional main audio driver utilizing the convex area of a conical shell diaphragm integrated with an acoustically reflective throating inertial regulator disk to provide spatial acoustic coupling between the audio driver and the atmosphere that approximates a live performance. The regulator disk is a rigid reflective plate mounted in a plane which forms an interior angle between 45° and 75° with the axis of the conic diaphragm. The plate may be flat, or shaped hyperbolically or exponentially. It

may be either integral with the conical diaphragm assembly or separate and attached by external means. A bass equalization device comprising a tube of controlled inertance having an acoustically resistive network inserted therein amplifies the output from the convex radiating surface of the audio driver and equalizes the bass and upper frequency audio power output. It also serves to cancel the out-of-phase upper frequency sound waves generated by the concave radiating surface. The bass equalization device and the inertance regulator disk control the resonant frequency and inertance of the system. The bass frequency output faces a cabinet enclosure equalized



without resonance so that 12 through 512 Hz. is generated without spurious harmonic partials or parasitic frequency components. Horizontal-radial and vertical dispersion speakers, comprising high frequency response speakers, are vertically oriented and face a conic, hyperbolic or exponential throating and inertance regulated dispersion surface for a full spatial distribution of the upper frequency audio output. The sound reproduction system may further be described as an inertially regulated sonic transducer. By controlling the diaphragm velocity and acoustic expansion rate audio reproduction can be recreated that approximates the spatial perspective of a live performance.

3,816,673

COAXIAL CABLE INCLUDING AT LEAST ONE REPEATER

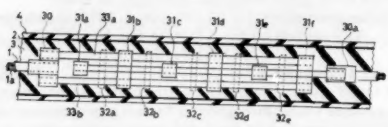
Kenichi Miya, Tokyo, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 24, 1972, Ser. No. 219,957

Claims priority, application Japan, Jan. 25, 1971, 46-1986; Mar. 19, 1971, 46-15077; Apr. 14, 1971, 46-23135

Int. Cl. H04b *3/36, 3/44, 3/38*

U.S. Cl. 179—170 R **2 Claims**



A coaxial cable comprising center steel wires, an inner conductor uniformly coated on the center steel wires, an outer tubular conductor, an inner insulator filled between the inner conductor and the outer tubular conductor, and an outer insulator coated on the outer surface of the outer tubular conductor. At least one unreflective section of wave absorbing material is provided in the inner insulator. A transmitted signal derived from the conductors of one side of the unreflective section is amplified by a wide band amplifier and applied to the conductors of the other side of the unreflective section. The wide band amplifier is embedded in the inner insulator and actuated by a dc difference between two opposed ends of a cut portion in one of the inner conductor and the outer conductor. Accordingly, a coaxial cable including at least one repeater is provided so as to have a uniform diameter.

3,816,674

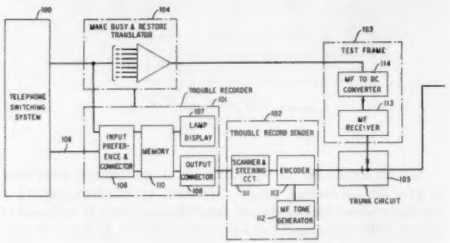
TELEPHONE SYSTEM TROUBLE ANALYZER

Stephen Stewart Andrews, Jr.; Louis Gawron, Jr., both of Reynoldsburg, and Gary John Meidl, Columbus, all of Ohio, assignors to Western Electric Company Incorporated, New York, N.Y.

Filed Aug. 8, 1973, Ser. No. 339,369

Int. Cl. H04m *3/26*

U.S. Cl. 179—175.2 R **21 Claims**



A telephone trouble reporting system is disclosed wherein various units of telephone equipment transmit trouble indications to a trouble recorder so that the troubles may be stored in memory and displayed on a lamp panel. A sender associated with the trouble recorder reads the memory and converts the trouble indications into multifrequency signals which are transmitted to a magnetic tape recorder.

A trouble analyzer and display circuit is provided at a maintenance center for analyzing troubles on previously recorded tapes or troubles received directly from the sender. The trouble analyzer and display comprises a light emitting diode matrix for visually displaying the trouble indications. A particular trouble can be designated for analysis by actuating a plurality of selector switches to select the coordinates of light emitting diodes that are peculiar to the designated trouble. After the trouble indication is displayed a sequence circuit interrogates each selector switch to determine if its setting "matches" an energized light emitting diode. A counter is incremented for each match and upon detecting a predetermined number of matches the circuit can be arranged to lock in the displayed troubles.

The telephone equipment can also be controlled from the maintenance center by setting a plurality of switches at the maintenance center to the desired control function. The control information is transmitted to the switching center in multifrequency format where it is translated into signals for performing a control function, such as making a trunk busy. When the control function has been performed the trouble recorder reports back to the trouble analyzer and display, the status of the telephone equipment.

3,816,675

ELECTRICAL GROUNDING DEVICE FOR TRACKED AIR CUSHION VEHICLES

David W. Grierson, Ann Arbor, Mich., assignor to Rohr Corporation, Chula Vista, Calif.

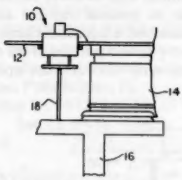
Filed Oct. 28, 1971, Ser. No. 193,411

Int. Cl. B60l *5/38*

U.S. Cl. 191—49 **3 Claims**

A safety electrical grounding device having a housing for attachment to an air cushion vehicle, a generally Y-shaped sole-

noid plunger in the housing which has arms extending from the housing and carrying a metallic shoe with teeth thereon, a braided copper strap with one end attached to the plunger through an opening in the housing and the other end for connection to the vehicle, springs in the housing urging the



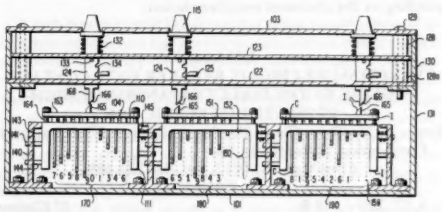
plunger upward to disengage the shoe from a reaction rail when the vehicle is in motion, and a solenoid coil in the housing which urges the plunger downward when actuated to engage the shoe teeth with the reaction rail when the vehicle is halted to provide a positive ground for the vehicle.

3,816,676

AUTOMATIC TELEPHONE DIALER WITH THREE-DIMENSIONAL CONDUCTIVE MATRIX SWITCH ASSEMBLY

Si-Ling Is'Ao, 39-1 Alley 30, Lane 172 Keelung Rd. Section 1, Taipei, China

Filed Mar. 3, 1972, Ser. No. 231,551
Int. Cl. H01h *9/00*; H04n *1/26*
U.S. Cl. 200—1 R **19 Claims**



An encoding device for an automatic telephone repertory dialer in which a plurality of rows and columns of elongated conducting elements which constitute a three dimensional matrix of conducting elements are selectively contacted by encoding means which are removably mounted and which encode different telephone numbers at different longitudinal positions on the conducting elements. The encoding means may be needles having two conducting portions thereon which are removably inserted in holes in an inverted U-shaped member movable between a first position in which the needles are out of contact with the elements and a second position in which the needles are in contact with the elements or may be conducting inserts which may be removably mounted on the arms of a movable mounting member.

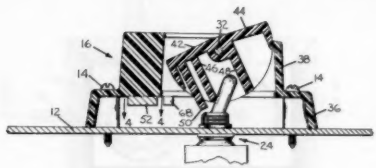
An impulse generating, or frequency generating, sampling system is used to sample the encoding device when a selected push button is depressed. The impulse generating system emits impulses corresponding to the digit encoded which impulses are terminated by a circuit which is closed when the encoded conducting elements is contacted by the sampling system. The frequency generating system emits two signals of different frequency for each digit encoded which frequencies are determined by appropriate capacitors connected into an oscillator system by the encoding means. If the encoding device is used in a PBX installation, the conducting elements are encoded by a member which contacts successive conducting elements in a row or column.

3,816,677

RETAIL TOOL SWITCH ADAPTOR WITH KEY LOCK

David Michael Soltez, Munhall, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 1, 1973, Ser. No. 366,198
Int. Cl. H01h *9/28*
U.S. Cl. 200—42 T **7 Claims**



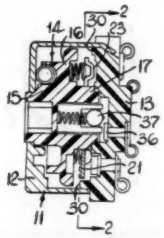
A safety cover for a toggle switch, comprising a cover mounted over the toggle handle and having mounted thereon a rockable actuator for operating the toggle and locking means for locking the actuator in the "off" position.

3,816,678

IGNITION SWITCHES

Derek Thornley, Nelson, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 30, 1969, Ser. No. 862,316
Claims priority, application Great Britain, Oct. 4, 1968, 47190/68
Int. Cl. H01h *27/00*
U.S. Cl. 200—44 **3 Claims**

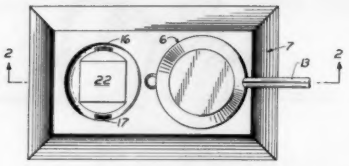


An ignition switch for use in combination with a key operated steering column lock for a road vehicle including a casing, having a base at one end thereof, a plurality of fixed contacts are mounted on the base, and a rotor is rotatable within the casing. A movable contact plate is rotatable relative to the base, with said rotor, and movable contacts on the movable contact plate are engageable with certain of the fixed contacts on the base in predetermined angular positions of the rotor relative to the casing, so as to complete electrical circuits between said certain fixed contacts. The movable contact plate is urged towards the base so that the movable contacts engage the base, and cooperating cam means are provided on the contact plate and the casing so as to move at least part of the movable contact plate away from the base to prevent completion of electrical circuits between certain of the fixed contacts, which, in the absence of said cam means would be completed by said movable contact plate in said angular positions of the rotor. The cam means serves to move at least part of the movable contact plate away from the base by flexing or tilting the contact plate, the contact plate being radially split to facilitate flexure thereof.

3,816,679
MAGNETICALLY OPERATED ELECTRICAL CONNECTOR

John E. Hotchkiss, 451 Cedar Hill Dr., San Rafael, Calif. 94903

Filed July 23, 1973, Ser. No. 381,987
Int. Cl. H01r 33/00
U.S. Cl. 200—51.09 6 Claims

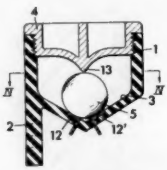


An electrical connector having mating frusto-conical plug and socket members with electrical conducting rings and contact members providing full swivel contact and a magnetically operated circuit closing means functioning exclusively on movement of the members to mated position.

3,816,680
ACCELERATION RESPONSIVE SWITCH

Masaru Suzuki, Chiryu; Masayoshi Iwata, Hajima, and Takeo Matsui, Gifu, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishi-Kasugai-gun, Aichi-Pref., Japan

Division of Ser. No. 173,711, Aug. 18, 1971, Pat. No. 3,723,680. This application Nov. 20, 1972, Ser. No. 308,249
Int. Cl. H01h 35/14
U.S. Cl. 200—61.51 6 Claims



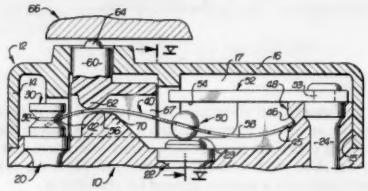
An acceleration responsive switching device which comprises a casing having, at its bottom portion, a reverse cone-shaped inner wall, a weight ball movably put in the casing and normally positioned on said reverse cone-shaped inner wall at its central portion, a switch means provided in the casing at the center of the bottom portion and being normally in contact with said weight ball and adapted to be disengaged from the contact with said ball when the ball is upwardly moved along an inclined face of said reverse cone-shaped inner wall due to a preselected acceleration.

3,816,681
SNAP ACTION SWITCH

Edward V. Lunenschloss, Arcadia, and Anthony R. Ford, West Covina, both of Calif., assignors to Airpax Electronics Incorporated, South El Monte, Calif.

Filed Apr. 24, 1972, Ser. No. 247,011
Int. Cl. H01h 13/36
U.S. Cl. 200—67 DB 4 Claims

A self-restoring snap action switch movable between normal and actuated positions and including an elongated, resilient, conductive leaf strip mounted between seats spaced closer together than the effective length of the strip, thus bowing the strip from the plane between the seats, and provided with an upper abutment member normally in contact with the upper strip surface approximately midway between the seats for imposing oppositely bowed portions on the strip. A downwardly movable actuator abuts the upper surface of the upwardly bowed strip portion, and downward movement of the actuator tends to flatten such portion until the strip snaps to its actuated position, with its lower surface abutting a lower abutment member in general vertical alignment with the upper abutment member. Stop means limit downward movement of the upwardly bowed portion of the strip. When the actuator contacts the strip between the apex of its upwardly

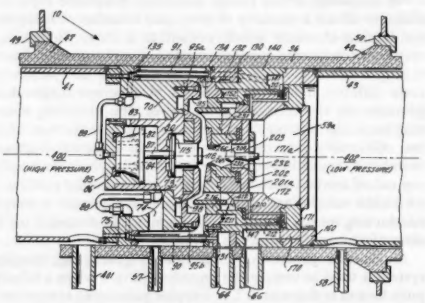


bowed portion and the adjacent seat, movement of the strip creates wiping contact between its surfaces and the upper and lower abutment members. One end of the strip may be V-notched to facilitate assembly of the strip to a terminal post or seat received in the V. The strip is electrically connected to external circuitry, desirably through its contact with one or both of the seats, which thus constitute a common terminal of the switch. At least one of the abutment members is conductive and is connectable to external circuitry through a terminal which may be either normally open or normally closed depending on the abutment member chosen.

3,816,682
TWO-PRESSURE CIRCUIT BREAKER WITH CONTACT COOLING BY THE DIRECT EXPANSION OF HIGH-PRESSURE DIELECTRIC GAS

James B. MacBeth, Claysville, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Mar. 14, 1972, Ser. No. 234,489
Int. Cl. H01h 33/82
U.S. Cl. 200—148 B 12 Claims



The stationary contact of a two-pressure circuit breaker is supported by insulation supports in high-pressure sulfur hexafluoride gas. Expansion orifices are placed in channels extending through the stationary contact and communicate between the high and low-pressure regions of the circuit breaker. Gas flowing through the expansion nozzles expands in the channel and cooled gas flows through the contact to the low-pressure region of the breaker. Preferably, the expansion nozzle is at the input end of the conduit formed in the stationa-

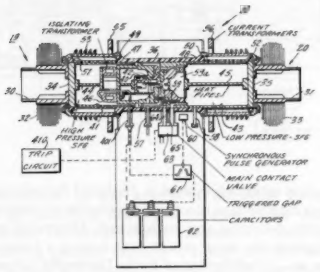
ry contact. Appropriate pressure differentials are maintained by the conventional compressor which is turned on when the pressure difference between high and low-pressure regions is below some given value.

3,816,683

GAS BLAST SYNCHRONOUS BREAKER WITH GAS BIASED CONTACTS

Rolf Mockli, Moillesulaz, Switzerland, assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed May 26, 1972, Ser. No. 257,337
Int. Cl. H01h *33/82*
U.S. Cl. 200—148 B **27 Claims**



A high power circuit breaker using sulfur hexafluoride as an interrupting medium has a main movable sleeve contact which surrounds an axially movable interrupter contact. The interrupter contact further serves as a valve between high pressure and low pressure SF_6 filled regions to permit gas blast through the separating interrupting contacts when the valve is opened. The main movable contact has an extension serving as a downstream shutoff valve which pre-encloses a volume downstream of the interrupter contact prior to the opening of the contacts. The interrupter contact is provided with an extending flange which serves as a short-circuited turn which cooperates with an energizing coil. Energization of the coil repels the short-circuited turn defined by the flange to initially open the blast valve. High-pressure gas is then applied against the movable contact to move the interrupter contact fully open after the valve is opened. The contacts are synchronously operated so that the contacts open immediately prior to a current zero. The opened contacts are disposed in the high-pressure SF_6 region.

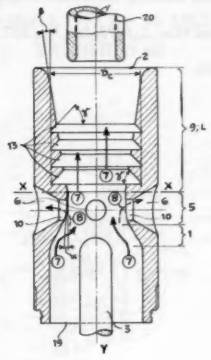
3,816,684

BLAST NOZZLE UNITS WITH RADIAL HOLES FOR SELF-BLASTING COMPRESSED GAS ELECTRIC CIRCUIT-BREAKERS

Benito J. Y Teijeiro, Bergamo, Italy, assignor to Magrini-Fabbriche Riunite Magrini Scarpa e Magnano M.S.M. S.p.A., Milan, Italy

Filed July 26, 1972, Ser. No. 275,219
Claims priority, application Italy, July 30, 1971, 26987/71The portion of the term of this patent subsequent to June 13, 1989, has been disclaimed.
Int. Cl. H01h *33/82*
U.S. Cl. 200—148 A **12 Claims**

A nozzle assembly for a compressed gas axial blast circuit breaker having a convergent inlet section, a divergent outlet section and an intermediate convergent section of smaller diameter than either the inlet or outlet sections. The intermediate section has radial holes, the mouths of which open into the gas flow stream and the outlet section has a plurality of annular rings of triangular cross-section, the cross-sectional areas decreasing and the spacing between adjacent rings increasing in a downstream direction of the outlet section.

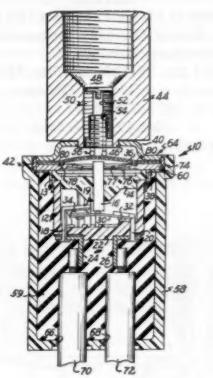


3,816,685

PRESSURE RESPONSIVE DEVICE HAVING IMPROVED MEANS FOR CALIBRATION

Peter O. Fiore, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1972, Ser. No. 317,905
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 S **10 Claims**



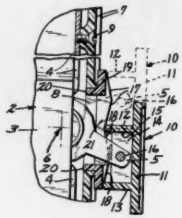
A pressure responsive device comprises a first chamber having a port sealed from a second chamber by a pressure responsive snap acting diaphragm. At pressures above an actuation pressure the diaphragm snaps from a first configuration to a second opposite configuration causing a motion transfer pin to move and actuate an electrical switch. The diaphragm snaps back to the first configuration when pressure decreases to a deactuation pressure, different than the actuation pressure, thereby permitting deactuation of the switch. A special diaphragm support is provided to enable calibration of both the actuation and the deactuation pressure independently of one another.

3,816,686

SLIDE ACTUATOR FOR TOGGLE SWITCH

Garland D. Budd, Minneapolis; Gregory R. Colombo, Stillwater, and Russell W. Waldo, Saint Paul, all of Minn., assignors to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Mar. 2, 1973, Ser. No. 337,546
Int. Cl. H01h 3/02
U.S. Cl. 200—330 3 Claims



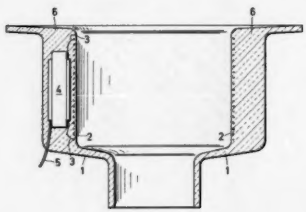
A switch operating slide member for concealing actuator arm wall mounted switches of the type generally known as toggle switches, and for imparting oscillatory or pivotal switch operating movement to the actuator arm when generally straight line movement is imparted to the slide member. The slide member is disposed in a substantially constant attitude in different positions of its sliding movement.

3,816,687

ELECTRICALLY HEATED WATER OUTLETS

Alfred Heitner, Buttfen, Germany, assignor to Klaus Esser KG, Norf (Bez. Dusseldorf), Germany

Filed Jan. 31, 1973, Ser. No. 328,287
Claims priority, application Germany, Feb. 3, 1972, 2205094; May 16, 1972, 2223838
Int. Cl. H05b 5/00
U.S. Cl. 219—10.49 4 Claims



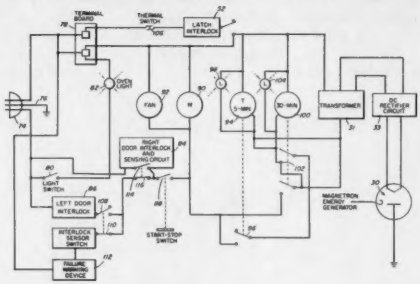
A heated water outlet having a tubular wall incorporating an electrical heater to prevent freezing of water in the outlet. The heater is supplied with low-tension voltage from a transformer which is disposed within or on the outlet wall. The heater can be in the form of a metal strip which may at least partially form the internal surface of the annular wall of the outlet. The outlet can be used for flat roofs, terraces, depot floors or like surfaces requiring draining.

3,816,688

SAFETY INTERLOCK SYSTEM FOR MICROWAVE OVENS

Rex E. Fritts, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Division of Ser. No. 240,626, April 3, 1972, Pat. No. 3,766,437. This application Mar. 1, 1973, Ser. No. 337,256
Int. Cl. H05b 9/06; H02h 5/04
U.S. Cl. 219—10.55 2 Claims



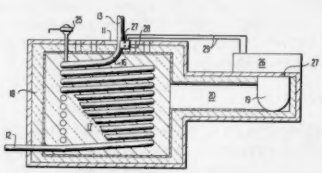
A safety interlock system is disclosed for microwave ovens or other high voltage electrical apparatus incorporating sensor means for detecting any malfunction. Means are provided for interrupting line input power or actuating a failure indicating device or a combination of both. Thermally actuated means, such as bimetallic or meltable elements, as well as circuit breakers, relays and fuses are described. The sensor means are associated with each of the interlocks and do not carry regular equipment load current until such time as a malfunction of the companion interlock occurs. Replacement of the faulty equipment by authorized personnel and manual resetting of the interrupt or indicating means before the oven is energized again reduce the risk of accidental radiation, electrical shock or damage to the apparatus.

3,816,689

APPARATUS FOR PRODUCING SUPER HEATED FLUIDS

Raymond E. Long, 26323 Ridge Rd., Damascus, Md. 20750

Filed Oct. 19, 1973, Ser. No. 408,224
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 9 Claims

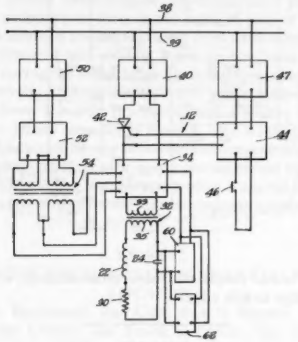


The disclosure relates to an apparatus for producing vapors and super heated fluids by converting electromagnetic energy into thermal energy through irradiation of an intermediate matrix. A coil of tubing having a high thermal conductivity is embedded within this absorbtive matrix and the matrix is heated by microwave energy. The fluid to be vaporized or super heated passes through the coil and is vaporized by thermal energy. It is also possible to select matrix and coil materials that will vaporize the fluid through both thermal and microwave irradiation. The invention is particularly applicable to a vapor powered vehicle that produces no environmental pollution.

3,816,690
INDUCTION HEATING APPARATUS

Eugene Mittelmann, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sept. 18, 1972, Ser. No. 290,227
Int. Cl. H05b 1/02, 5/04
U.S. Cl. 219—10.77 8 Claims



The embodiment of the invention disclosed herein is directed to an induction heating apparatus which includes solid state circuitry of the generator means and a tuned circuit induction heating member capable of being remotely located from the generator and readily movable to various positions. The induction heating unit comprises an inductance element and a series connected capacitance element forming a series resonant circuit at an operating frequency. The generator includes frequency adjusting means so that substantial coincidence of frequency between the generator and the frequency of resonance of the tuned inductance element is obtained. A wattsecond responsive circuit is coupled to the inductance unit to terminate operation thereof upon sensing a desired predetermined measurement of wattseconds. Also coupled to the inductance unit is an over voltage sensing circuit for sensing the value of voltage developed across the capacitance element, when in a resonant tuned condition, thereby preventing over voltages from occurring and damaging the components.

3,816,691
EASILY REPLACEABLE EDM ELECTRODE

Albert J. Flis, 13661 Bellbrook Road, Brookpark, Ohio 44142

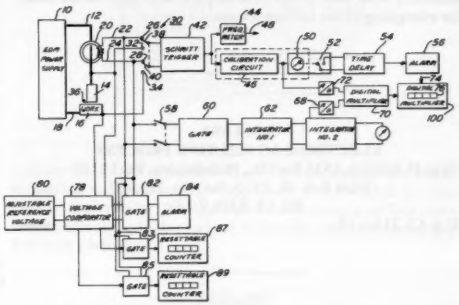
Filed Mar. 4, 1971, Ser. No. 120,911
Int. Cl. B23p 1/08, 1/04
U.S. Cl. 219—69 E 2 Claims

The device described herein comprises an easily assembled, automatically registered disposable junction particularly suitable for replaceable electrodes used in spark erosion machining. The junction comprises two shanks having their abutting ends shaped so that the two shanks cannot be separated when a close-fitting sleeve is positioned to embrace a substantial portion of each of the two abutting shanks.

3,816,692
ELECTRICAL DISCHARGE MACHINING EFFICIENCY AND SAFETY MONITORING SYSTEM

Samuel C. Ratmansky, 1706 E. Willow Grove Ave., Philadelphia, Pa. 19118

Filed Mar. 2, 1972, Ser. No. 231,215
Int. Cl. B23k 9/16
U.S. Cl. 219—69 C 17 Claims

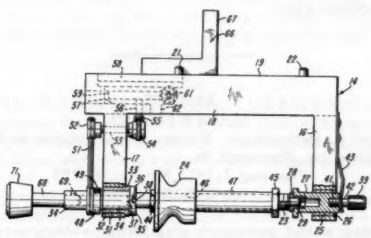


An electrical discharge machine efficiency and safety monitoring system in which the energy dissipated or charge flow across the cutting gap of individual spark pulses, the output pulse frequency of the electrical discharge machine and the percentage of pulses of the electrical discharge machine which actually cause conduction across the cutting gap are in process measured and displayed. The results of these three measurements indicate the metal removal rate efficiency of the settings on the EDM machines, RMS surface finish of the work, size of the spark gap or overcut, depth of pitting on work, recast layer on work, size of micro-cracks on work, and may also be multiplied together manually or by means of hardware to obtain a product called the metal removal rate factor. This is indicative of the actual amount of metal removed by the EDM machining process when correlated with a reference chart, and will indicate the highest cutting efficiency possible at a given RMS finish, when compared with other settings. An alarm may also be provided to provide a signal in response to the percentage of pulses crossing the gap dropping below a predetermined minimum. Safety means in the monitoring system are provided to detect incipient and steady state arcing or burning conditions in order to signal the EDM operator to take corrective action to avoid ruining the workpiece.

3,816,693
ELECTRICAL DISCHARGE MACHINE ADAPTER

Ralph A. Braun, 1485 Delynn Dr., Centerville, Ohio 45459

Filed Nov. 17, 1972, Ser. No. 307,595
Int. Cl. B23k 9/16
U.S. Cl. 219—69 E 14 Claims



Apparatus and a system in a machine performing cutting, contouring or like machine operations by an electrical

discharge process, featuring use of an electrode mounting adapter attachable to a reciprocable ram, machine head or the like. Electrodes are replaceable without removing the adapter, which is attachable in alternative positions to bring the electrodes to the work either in a sense broadside of endwise thereof. The adapter is a unitary part incorporating in an integrated relation a support body, a rotatable arbor which independently mounts removable electrodes and a turbine means to rotate the arbor. The machining process is carried out in a dielectric fluid bath which provides a source of pressure fluid for energizing of the turbine means.

3,816,694

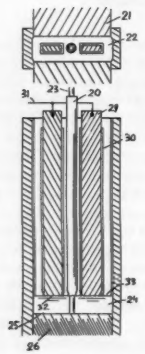
ELECTROSLAG MELTING PROCESS

Rene D. Colinet, 1525 Earl St., Philadelphia, Pa. 19125

Filed Feb. 20, 1973, Ser. No. 333,697

Int. Cl. B23k 9/18

U.S. Cl. 219—73 **3 Claims**



Modified electroslag metal melting process for welding, refining, ingot making, where metal from bars or wires (thereafter called "bars") is added to molten pools by the method of dropping said bars into said pools by free or controlled gravity action, without any such bar conducting electric current, until said bar comes to rest temporarily on the solidified bottom of the lower metal pool. Heating of the upper slag pool, needed to melt such bar, is obtained from stationary fusible metallic electrode or electrodes connected at their tops to one or more sources of high intensity electric current, said electrodes being devoid of any function of guiding said dropping bar.

3,816,695

FLASH WELDERS

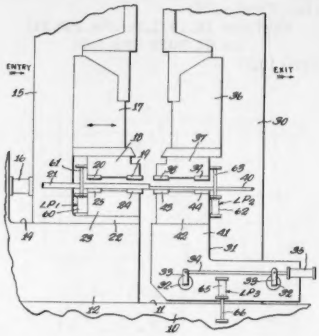
James F. Deffenbaugh, Warren, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Aug. 2, 1973, Ser. No. 384,797

Int. Cl. B23k 11/04

U.S. Cl. 219—100 **11 Claims**

A flash welder, particularly adaptable for welding two metal sheets of unequal thickness. The invention incorporates means for automatically aligning the horizontal centers of the mating edges of two sheets of unequal thickness within close tolerances, without requiring any manual operation on the part of an operator. The invention also enables optimum welding of two metal sheets that have cross-sections which vary from side edge to side edge.



3,816,696

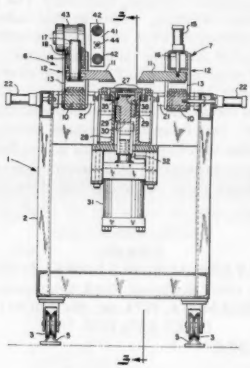
STRIP SHEARING AND WELDING APPARATUS

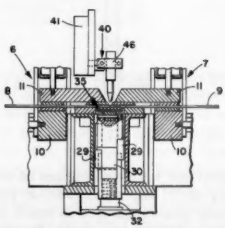
Donald J. Wheeler, Franklin, Pa., and Victor Lohrenz, Bedford, Ohio, assignors to Guild Metal Joining Equipment Company, Bedford, Ohio

Filed Dec. 20, 1971, Ser. No. 209,606

Int. Cl. B23k 9/12

U.S. Cl. 219—124 **10 Claims**





The strip shearing apparatus includes a pair of longitudinally spaced stationary shear knives and a pair of movable

shear knives carried by a pivotal support for pivotal movement between the stationary shear knives. A weld backup bar electrode may also be mounted on the pivotal support for movement into engagement with the underneath sides of the strip ends after shearing and indexing of the strip ends to the welding position to clamp the strip ends firmly in position for welding. During the welding operation, the movable shear knives on the pivotal support are desirably located above strip pass height to permit reshearing of the strips after joining if it becomes necessary to remove the weld. A pair of clamp assemblies indexable toward and away from each other between the strip shearing and welding positions continuously clamp the strips during the shearing and welding operation, and may be of generally C-shape to allow the entire apparatus to be removed from the strip processing line after the strip ends have been joined together if desired. The welding assembly may also be carried by one of the strip clamp assemblies for indexing movement therewith, and a pivotal mount may be provided for the welding assembly to protect it against damage by premature opening of the associated clamp assembly.

3,816,697

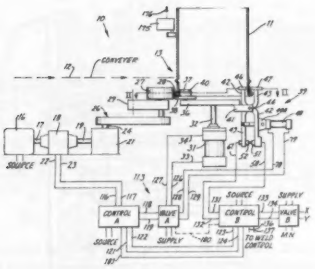
SHEET THICKNESS DETECTOR AND ATTACHMENT LOCATOR

Ronald A. Derdowski, Bay City; Don S. Hayner, Hampton Twp., Bay County, and Frank S. Parker, Bay City, all of Mich., assignors to Newcor, Inc., Bay City, Mich.

Filed Oct. 16, 1972, Ser. No. 297,884

Int. Cl. B23k *11/10*; **H01m** *3/16*

U.S. Cl. 219—107 **14 Claims**



A manufacturing system applicable to seam welded metal containers for the fastening of attachments thereto in a predetermined relationship to the seam. The container is supported upon suitable means for rotating same about its longitudinal axis and a mechanically actuated feeler switch is arranged thereagainst for responding to the increased thickness of material in the location of the seam and delivering a signal. Said signal initiates a timer control which stops the rotation of the container at a predetermined angular spacing from the seam and initiates the attaching operation which latter may occur in the same or at a subsequent station.

3,816,698

ARRANGEMENT FOR PRODUCING SCREENED PRINTING FORMS, SUCH AS PRINTING CYLINDERS, BY MEANS OF AN ELECTRON BEAM

Klaus Wellendorf, Kitzeberg; Peter Padberg, Preetz, and Bernd Struck, Kiel, all of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Kiel, Germany

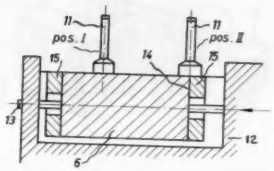
Filed Feb. 13, 1973, Ser. No. 332,129

Claims priority, application Germany, Feb. 15, 1972, 2207090

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **8 Claims**

An engraving apparatus for producing a printing matrix such as a printing cylinder including an electron beam producing device having a vacuum chamber opened at its end facing the cylinder and forming a gap with it, the device is adapted to more over the cylinder surface to perform the engraving operation, an end member attached to both ends of the



cylinder to assure that the vacuum is not lost by the beam producing device when the engraving is performed at both ends of the cylinder, the end members forming a surface continuity with the cylinder and are removable after the engraving has been performed.

3,816,699

ENGRAVING SYSTEM FOR PRODUCING A SCREENED ROTARY PRINTING MATRIX WITH A VARIABLE DIAMETER

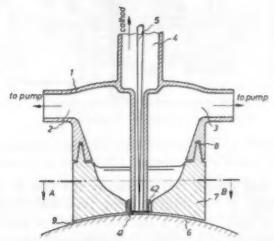
Klaus Wellendorf, Kitzeberg bei Kiel; Peter Padberg, Preetz, and Bernd Struck, Kiel, all of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Kiel, Germany

Filed Feb. 13, 1973, Ser. No. 332,128

Claims priority, application Germany, Feb. 15, 1972, 2207090

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **5 Claims**



An engraving apparatus for producing a printing cylinder with an electron beam, a device for producing the beam and having a vacuum chamber housing, the vacuum chamber housing forming a gap with the cylinder during engraving, the lower part of the housing being removable and has a curvature to fit a predetermined cylinder size to form a gap therewith.

3,816,700

APPARATUS FOR FACILITATING LASER SCRIBING

Myron Jerome Weiner, Los Angeles; Floyd Rufford Pothoven, Hawthorne, both of Calif., and Nolton Clement Johnson, Jr., Bend, Oreg., assignors to Union Carbide Corporation, New York, N.Y.

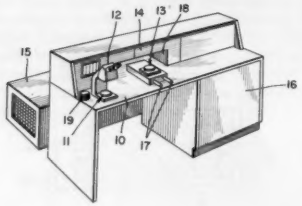
Division of Ser. No. 191,434, Oct. 21, 1971, abandoned. This application July 19, 1973, Ser. No. 380,839

Int. Cl. B23k *27/00*

U.S. Cl. 219—121 L **4 Claims**

A substrate alignment assembly station is provided next to a scribing assembly station for receiving a substrate from the

alignment station after alignment for automatic scribing. By this arrangement, a single operator can align a substrate during the period of time a previous substrate is being scribed so that a stack of substrates may be scribed in rapid succession.



3,816,701

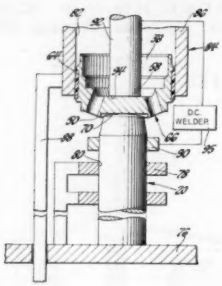
METHOD FOR MANUFACTURING WELDED PISTON SHOCK ABSORBER

Joseph R. Stormer, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 115,222, Feb. 16, 1971, Pat. No. 3,724,615. This application Mar. 14, 1973, Ser. No. 340,957

Int. Cl. B21j *5/00*

U.S. Cl. 219—152 **1 Claim**



A piston and piston rod assembly for use in a hydraulic shock absorber of the direct acting type has an open ended piston with a base having a flat weld surface thereon fixedly secured to the end of a piston rod. Rebound and compression valving are secured in the open end of the piston and flow passageways are formed in the base of the piston in close noninterference relationship with the weld surface on the piston base. The piston and piston rod are connected by an improved method which maintains flow paths in the connected parts.

3,816,702

ELECTRONIC ISOTHERMAL DEVICE

Robert E. Green, 1105 E. Oxford, Santa Ana, Calif. 92707

Filed June 26, 1972, Ser. No. 266,280

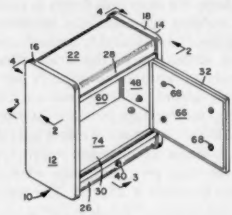
Int. Cl. F27d *11/02*

U.S. Cl. 219—413 **10 Claims**

An electronic isothermal device capable of maintaining relatively even temperatures within a given container comprising an electronic circuit and a series of unique heaters in series therewith.

The container is formed as a box having interior side walls made from boards such as printed circuits having a layer of conductive strands such as solder thereon positioned in a substantially uniform pattern. The boards forming side walls of the container are utilized as heating elements and are controlled by an electronic circuit comprising a series of discrete components or an integrated circuit in series therewith.

The control circuit which can be placed on the circuit boards comprises an amplifier with a pair of transistors respectively connected to a thermistor and a resistor which serve to control a silicone controlled rectifier (SCR). The SCR controls a flow of current through the circuit boards for heating purposes when the thermistor registers changes in ambient temperature.



3,816,703

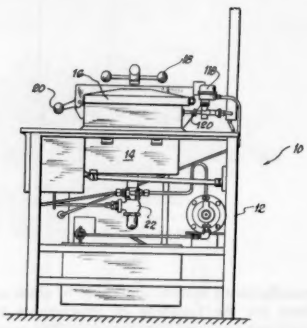
CHICKEN COOKING APPARATUS

Chester Binks, La Grange, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Division of Ser. No. 120,641, March 3, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 392,941

Int. Cl. F27d *11/02*

U.S. Cl. 219—440 **5 Claims**



An automatic fryer for chicken is disclosed. Chicken is placed in a vessel containing heated cooking oil and is sealed therein. A control circuit maintains a first temperature and atmospheric pressure for a first time period and, after the conclusion of the first time period, automatically maintains the oil above a lower temperature level and desirably pressurizes the vessel. After a second time period, the control circuit automatically vents the vessel, signals, and resets. Automatic control is provided alternately for full or partial loads, to prevent overcooking of partial loads, and to assure the proper cooking of full loads.

3,816,704

SURFACE HEATING APPARATUS

Marcus P. Borom, Schenectady, and Joseph E. Burke, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

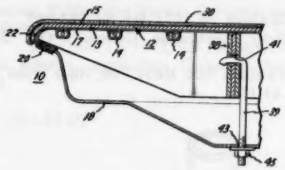
Filed Mar. 20, 1972, Ser. No. 236,104

Int. Cl. H05b *3/68*

U.S. Cl. 219—462 **8 Claims**

A smooth surface heating apparatus is provided having a heat spreader plate of high thermal conductivity coated, at

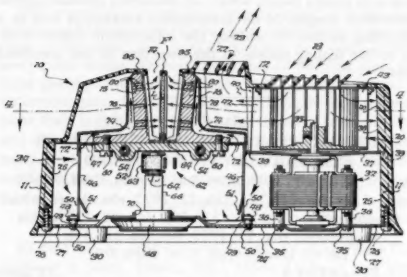
least on its upper surface, with a glass-ceramic material containing a predominant crystalline phase of lithium disilicate in a glassy matrix and having a coefficient of expansion in the range of $80–120\times10^{-7}$ per °C. An insulated electrical resistance heating element and a reinforcing member are attached to the underside of the heat spreader plate. A reflector pan is provided beneath the heating element to direct the heat in an upward direction.



3,816,705
DEVICE FOR HEATING THERMOPLASTIC EYEGLASS FRAMES

Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Filed Dec. 13, 1971, Ser. No. 207,086
Int. Cl. H05b *1/00*
U.S. Cl. 219—521 **10 Claims**



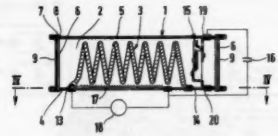
A device for heating a thermoplastic eyeglass frame having a rim and bridge portion and a temple portion includes a housing having a pair of spaced infrared heat radiating surfaces mounted therein. The surfaces form an open-ended channel therebetween for receiving one of the eyeglass frame portions while permitting the other of said frame portions to remain out of range of the heat radiating surfaces. The heat radiating surfaces comprise spaced external surfaces on a heating block having a heating element embedded therein. The heating element is spaced remotely from the heat radiating surfaces so as not to subject the portion of the frame in the channel to direct heat from the element. A fan in the housing provides for circulation of ambient air through the housing for preventing overheating of the housing. Some of the circulated air is diverted through apertures in the radiating surfaces into the channel to prevent entrance of cold drafts to the channel. A temperature control regulates the temperature of the radiating surfaces.

3,816,706
HEATING MEMBER FOR A HAIR DRYER

Klaus Meywald, Kandel, Germany, assignor to Fritz Eicherauer, Kandel, Germany

Filed Feb. 20, 1973, Ser. No. 333,735
Claims priority, application Germany, Dec. 23, 1972, 2263260
Int. Cl. H05b *3/06*
U.S. Cl. 219—537 **18 Claims**

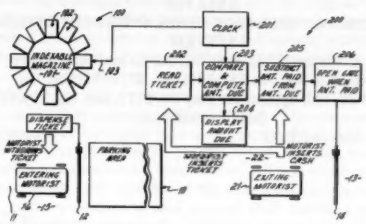
A heating member for a hair dryer or other blower-operated heating appliance, whose wire heating element is disposed in a flow duct formed by a box-shaped frame of insulating panels and comprises a heating wire helically wound on a self-supporting core which is coiled to a diameter corresponding to the distance between opposite panels and is disposed with its transverse axis transverse to the flow direction. The element is attached to the frame only by its terminals which are secured to one of the panels. One embodiment has one such helical coil, while another has two such coils which are located by notches on opposite sides of a central spacer penel. A tapping resistor for the blower motor, and a thermal cut-out, are provided on the panels.



3,816,707
EMBOSSED CARD READER

Vernon T. Kleinmeyer, and Thomas J. Schinner, both of Cincinnati, Ohio, assignors to Cincinnati Time Recorder Company, Inc., Cincinnati, Ohio

Continuation of Ser. No. 143,573, May 14, 1971, abandoned.
This application Mar. 2, 1973, Ser. No. 337,451
Int. Cl. G06k *7/04*; **B41l** *45/02*; **H01h** *43/08*
U.S. Cl. 235—61.11 C **6 Claims**



A reader particularly for cards that are embossed with bar coded information reads the information from the cards by scanning the underside of the card with feeler fingers which engage in the depressions of the underside of the code bars to advance switches to positions which decode the encoded information. A coding method in which the information is carried in the distance that a code bar is spaced along a scanning path is provided.

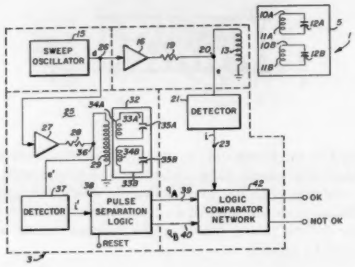
3,816,708
ELECTRONIC RECOGNITION AND IDENTIFICATION SYSTEM

Charles A. Walton, Los Gatos, Calif., assignor to Proximity Devices, Inc., Sunnyvale, Calif.

Filed May 25, 1973, Ser. No. 363,851
Int. Cl. G06k *7/08*
U.S. Cl. 235—61.11 H **13 Claims**

An improved electronic recognition and identification system for recognizing and identifying the resonant frequency of a coded external passive network. The system comprises an active network including a radio frequency sweep oscillator driving a sensing coil to generate an external electromagnetic field for inductive coupling to the passive resonant network when said passive network is brought within the proximity of the sensing coil. The active network further includes a vector detector for detecting variations in the signal across said sensing coil due to said passive network and for generating de-

tector signals representative of the resonant frequency of the passive network, an internal reference signal generating network for establishing select signals representative of a reference identification frequency, and a comparator network responsive to said detector and said select signals for generating control signals indicative of coincidence of non-coincidence of the detector and select signals, said logic comparator network having signal integrating capability to permit recognition of a sustained signal from the detector network and distinguish the sustained signal from random noise or other disturbances.



3,816,709

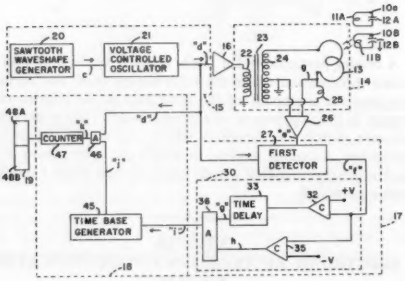
ELECTRONIC IDENTIFICATION AND RECOGNITION SYSTEM

Charles A. Walton, 20 E. Main St., Los Gatos, Calif. 95030

Division of Ser. No. 212,281, Dec. 27, 1971, Pat. No. 3,752,960. This application May 14, 1973, Ser. No. 359,912

Int. Cl. G06k *7/08*

U.S. Cl. 235—61.11 H **5 Claims**



An electronic identification and recognition system for identifying or recognizing an object carrying an electrically passive circuit. The system comprises an active electrical signal generation network with a sensing coil for generating a magnetic field within the proximate area of said sensing coil; and an object having a passive electrical circuit with a coded resonant frequency, said object being adapted to move relative to and from said proximate area and adapted for inductive coupling with said active system. The active generation network being further adapted to generate digital control signals responsive to the resonant frequency of the passive object when said passive object is inductively coupled with said active system.

3,816,710

DEVICE FOR CHANGING INDICIA INTO ELECTRICAL SIGNALS

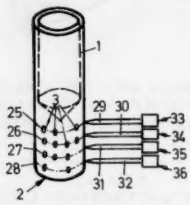
Udo Hoffman, Erlangen, and Siegfried Eiben, Hessdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 20, 1971, Ser. No. 182,083

Claims priority, application Germany, Oct. 3, 1970, 2048714

Int. Cl. G06k *7/00;* **H01v** *7/00;* **H04r** *17/00*

U.S. Cl. 235—61.11 C **1 Claim**



A device is used for changing into electrical signals indicia applied to an information carrier in the shape of nonlevel markings, such as holes, notches and the like. The device is particularly characterized by a piezoelectric converter connected with feeling means which are resiliently pressed against the inscribed lengths of the information carrier, as well as a transporting device for shifting the information carrier relatively to the feeling means in the direction of the inscribed lengths.

3,816,711

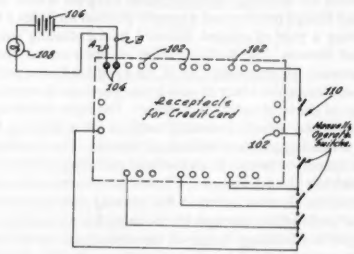
DECODING APPARATUS AND SYSTEM FOR AN ELECTRICALLY ENCODED CARD

William W. Bliss, 401 N. Huntley, Los Angeles, Calif. 90048

Division of Ser. No. 219,724, Jan. 21, 1972, abandoned, which is a continuation of Ser. No. 328,290, Jan. 30, 1973. This application Dec. 11, 1972, Ser. No. 313,698

Int. Cl. G06k *19/02, 7/04;* **G09f** *3/02*

U.S. Cl. 235—61.11 A **3 Claims**

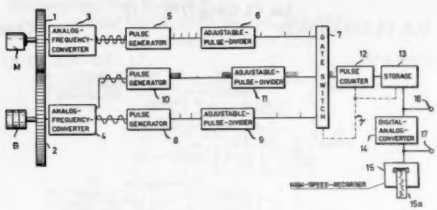


A decoding system is provided for an electrically encoded card, or the like. The card comprises a multi-layered laminated structure with a plurality of printed circuit elements embedded therein. One of the embedded printed circuit elements comprises a master circuit which is standard, for example, for a group of cards; and another of the embedded circuit elements comprises an encoding circuit which identifies and is different from each card and which, in each instance, completes selected circuit breaks in the master circuit. The card is checked out by the decoding system of the invention which contains, for example, a similar master printed circuit element, and in which complementary adjustments must be made to the connections of the aforesaid encoding circuit in order to complete the circuit and check out the card.

3,816,712
METHOD AND APPARATUS FOR DETECTING RELATIVE DEVIATIONS IN POSITION OF TWO PARTS MOVED IN A PREDETERMINED DESIRED RELATIONSHIP

Klaus Herzog, Heidenheim (Brenz), Germany, assignor to Carl Zeiss-Stiftung d/b/a Carl Zeiss, Oberkochen, Germany

Filed Nov. 13, 1972, Ser. No. 305,674
Claims priority, application Germany, Nov. 29, 1971, 2159002
Int. Cl. H03k 21/30
U.S. Cl. 235—92 MP 11 Claims

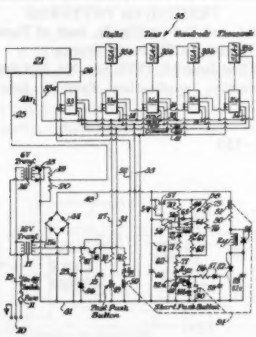


The invention contemplates measurement of displacement deviations between two relatively movable parts, using movement of the respective parts to generate first and second primary-pulse trains, wherein the pulses of the first train determine gate-opening functions and the pulses of the second train determine gate-closing functions. A finely divided secondary-pulse train is also generated by movement of one of the parts, and the gate determines the number of secondary pulses passed to a counter, for a direct indication of the instantaneous deviation in relative position of the parts.

3,816,713
ELECTRICAL DEPLATING READ-OUT APPARATUS

Terrence A. Dear, Elkton, Md.; Alfred Lechner, and Willson C. Swartout, both of Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1973, Ser. No. 350,642
Int. Cl. G11c 13/02
U.S. Cl. 235—92 MT 7 Claims

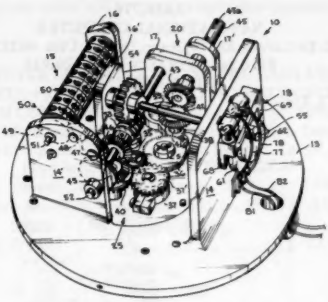


An electrical deplating read-out apparatus wherein the deplating current is preselected to give an indicated value of total deplating current in milliampere-second units.

3,816,714
COMBINATION TRANSMITTER AND COUNTER DEVICE FOR LIQUID FLOW METER

Roy D. Reed, 1033 Cunningham, Corpus Christi, Tex. 78411

Filed May 31, 1973, Ser. No. 365,615
Int. Cl. G06c 15/42; B67d 5/26
U.S. Cl. 235—94 R 8 Claims

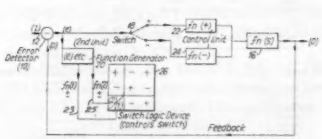


A combination counter and transmitter device for use with a liquid flow meter includes a coupling for connecting the device to the flow meter for rotating a gear on the coupling in response to liquid flow through the meter. A gear train drives counter wheels to count the volume of liquid flow through the meter and interconnected with the gear train is additional gear means for driving a first shaft which may be coupled to a correction arrangement for determining a correction factor to be applied to the volume as shown by the counter wheels of the present invention. The first shaft when not attached to the correction equipment may be employed to operate a sampler in the liquid line or for transmitting pulses or for other uses. Still additional gear means associated with the gear train and interconnected with the gear means that moves the counter wheels and the first shaft means rotates a second shaft means on which are mounted cam means. A switch is pivotally mounted adjacent the cam means and the gear train ratio is such that for each revolution of said second shaft means a predetermined volume of liquid flow will pass through the meter, and as the cam means is rotated by the shaft means, the switch means is actuated to generate a pulse for transmitting to any other desired equipment as an indication of a predetermined flow of liquid through the meter.

3,816,715
CONTROL SYSTEMS

Christopher Linley Johnson, Hartshorne near Burton-on-Trent, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Nov. 10, 1972, Ser. No. 305,288
Claims priority, application Great Britain, Nov. 17, 1971, 53335/71
Int. Cl. G05b 13/02
U.S. Cl. 235—150.1 9 Claims



A control system for producing an output signal which is proportional to a input signal comprises two operating circuits each having a different rate of response on receiving an input signal. A switch is provided for switching one or both of the

operating circuits into operation. The switch is controlled by control means which is in turn controlled by means for detecting an error between the input signal and the corresponding output signal. The control means controls a switch in accordance with the value of the input signal, the output signal or the error whereby the error is maintained at a minimum value.

3,816,716

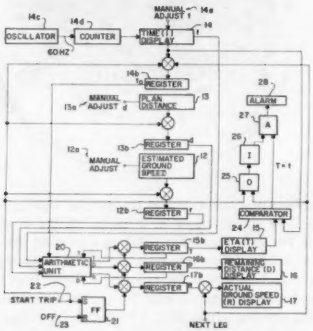
NAVIGATIONAL COMPUTER

Ray G. De Garmo, 235 S. Grape, Denver, Colo. 80222

Filed Jan. 4, 1973, Ser. No. 320,922

Int. Cl. G06f *15/50*

U.S. Cl. 235—150.2 **7 Claims**



A navigational computer that employs displays and registers to place in and retain the estimated ground speed, the time of day, and the distance of the leg of the flight. An arithmetic unit accepts such information and calculates the estimated time of arrival, the actual ground speed, and the distance remaining in the present leg of the flight. Three readout displays provide such data to the pilot.

3,816,717

ELECTRICAL FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

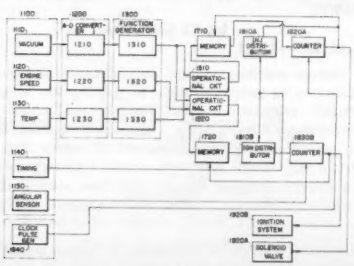
Hiroshi Yoshida; Noriyoshi Ando, and Kazuo Oishi, all of Kariya, Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Continuation of Ser. No. 126,830, March 22, 1971, abandoned. This application Jan. 26, 1973, Ser. No. 327,603

Claims priority, application Japan, Mar. 26, 1970, 45-25681; Apr. 7, 1970, 45-29684; Apr. 10, 1970, 45-30951; Apr. 15, 1970, 45-32103; Apr. 15, 1970, 45-32106; Apr. 22, 1970, 45-34606

Int. Cl. F02d *5/00, 37/02;* **G05b** *15/02*

U.S. Cl. 235—150.21 **7 Claims**



An electrical fuel control system for internal combustion engines, wherein various data representing the operating conditions of an internal combustion engine are converted into digital signals which are operated on to generate such fuel controlling signals that suit the required characteristics of the engine, whereby the quantity of fuel injected as well as the spark timing are controlled to ensure the optimum amount of fuel injected and the optimum spark timing.

3,816,718

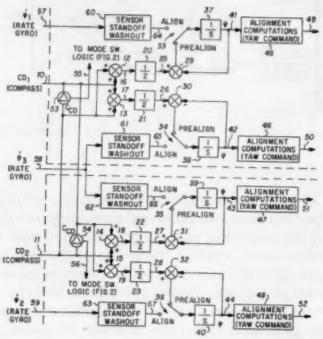
SYNTHESIS OF FAIL OPERATIONAL HEADING INFORMATION (COURSE DATUM) FROM NONFAIL OPERATIONAL INPUT SIGNALS

John C. Hall, Cedar Rapids, Iowa, and Robert F. Tribuno, Santa Monica, Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed Nov. 24, 1972, Ser. No. 309,306

Int. Cl. G06g *7/78, 7/12*

U.S. Cl. 235—150.26 **8 Claims**



Synthesis of fail operational plural output signals from input signals, insufficiently redundant to be fail operational in themselves, is accomplished by referencing plural integrators to the input signal and subsequently integrating down the references by application to the integrators, in lieu of the input signals, respective ones of a plurality of further input signals each of which is a measure of the rate of change of the referencing inputs, and of themselves sufficiently redundant to provide fail operational control in subsequent control means to which a logically best one of the output signals is applied.

3,816,719

ELECTRONIC DEVICES FOR THE PROGRAMMED TRACING OF PATTERNS

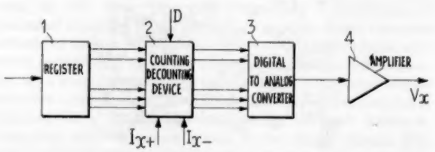
Jacques Trotel, and Robert Sigelle, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 19, 1973, Ser. No. 371,468

Claims priority, application France, June 23, 1972, 72.22784

Int. Cl. G06f *3/14*

U.S. Cl. 235—151 **7 Claims**



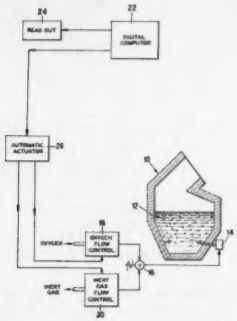
A system is capable on the basis of data produced by a data processing machine of generating signals which can be applied to the horizontal and vertical deflection systems of an electronic device capable of producing predetermined traces.

Each trace is broken down into elementary figures of three predetermined shapes, rectangle or parallelograms. The beam scans line-by-line, alternately from left to right and right to left, point by point, through each elementary figure, under the control of circuits supplied with the coordinates of a point in each figure, a number corresponding to the number of points to be scanned, the number of lines in each figure and a shape code.

3,816,720
PROCESS FOR THE DECARBURIZATION OF MOLTEN METAL

Edwin Francis Bauer, Niagara Falls; Roger Nels Dokken, Katonah; Robert Amos Hard, Lewiston, and Umesh Kumar Malhotra, Peekskill, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,454
Int. Cl. C21d *3/04*; **G06f** *15/46*
U.S. Cl. 235—151.12 **45 Claims**

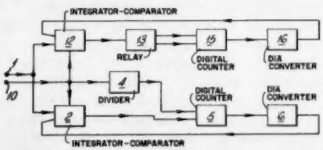


A process for making steel by refining a predetermined mass of molten metal having a composition containing at least carbon and iron comprising: injecting oxygen into such mass with a gaseous diluent at a first dilution ratio and calculating from the activity coefficient of each element in the mass a theoretical equilibrium partial pressure of carbon monoxide for the oxidation reaction of each element; calculating the absolute maximum partial pressure of carbon monoxide; selecting the lowest partial pressure and calculating a new metal analysis for the mass; changing the dilution ratio upon meeting a given criterion and repeating the process until the carbon level of the mass has dropped to a predetermined level.

3,816,721
CALCULATING APPARATUS

Peter Raymond Turner, London, England, assignor to Molins Limited, London, England

Filed Nov. 14, 1972, Ser. No. 306,460
Claims priority, application Great Britain, Nov. 17, 1971, 53337/71
U.S. Cl. 235—151.13 **6 Claims**

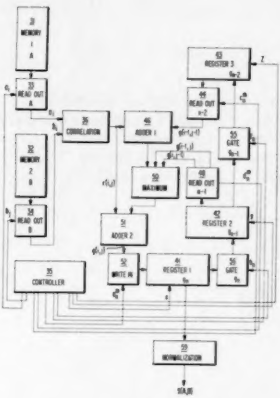


This invention mainly concerns apparatus for calculating the standard deviation of the mass of a succession of cigarettes being produced on a continuous-rod cigarette making machine. The device receives, from a Beta-ray scanning device, a continuously varying voltage indicative of the tobacco mass of a given portion of the continuous rod, and a series of pulses synchronised with the cut-off so that a pulse appears whenever a portion of the continuous rod which will later be cut is subjected to the Beta-radiation beam. The continuously varying voltage is integrated over the period between the pulses to give a measure of the total mass of tobacco in the portion of the rod which will become an individual cigarette.

3,816,722
COMPUTER FOR CALCULATING THE SIMILARITY BETWEEN PATTERNS AND PATTERN RECOGNITION SYSTEM COMPRISING THE SIMILARITY COMPUTER

Hiroaki Sakoe, and Seibi Chiba, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 28, 1971, Ser. No. 184,403
Claims priority, application Japan, Sept. 29, 1970, 45-84685; Dec. 21, 1970, 45-114149; Dec. 29, 1970, 45-121142
Int. Cl. G06f *15/34*
U.S. Cl. 235—152 **23 Claims**



The feature vectors of a sequence representative of a first pattern are correlated to those in another sequence representative of a second pattern in such a manner that the normalized sum of the quantities representative of the similarity between each feature vector of a sequence and at least one feature vector of the other sequence may assume an extremum. The extremum is used as the similarity measure to be calculated between the two patterns. With the pattern recognition system, the similarity measure is calculated for each reference pattern and a variable-length partial pattern to be recognized. The partial pattern is successively recognized to be a permutation with repetitions of reference patterns, each having the maximum similarity measure.

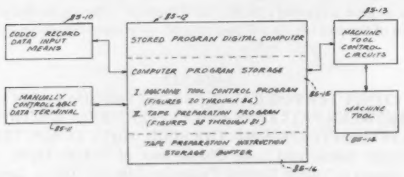
3,816,723
MACHINE TOOL DATA SYSTEM AND METHOD

Kenneth Leonard Slawson, Depew, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 744,392, July 12, 1968, Pat. No. 3,634,662, which is a continuation-in-part of Ser. No. 652,968, July 12, 1967, abandoned. This application June 7, 1971, Ser. No. 150,637
Int. Cl. G06f *15/46*; **B23q** *21/00*
U.S. Cl. 235—151.11 **1 Claim**

A machine tool data system for receiving and storing abbreviated instructions representing blocks of machine tool control data and including pattern type instructions such as

copy, mirror image and tool change each involving a series of such blocks, the computer responding to editing instructions such as insert or delete as to specified lines of stored instructions or computing the blocks represented by the stored instructions for transmission to an output device such as a tape punch, the computer generating the blocks of a pattern type


CODED RECORD DATA INPUT MEANS
STORED PROGRAM DIGITAL COMPUTER
COMPUTER PROGRAM STORAGE
I. MACHINE TOOL CONTROL PROGRAM (FIGURES 3D THROUGH 8A)
II. TAPE PREPARATION PROGRAM (FIGURES 9A THROUGH 9I)
TAPE PREPARATION INSTRUCTION STORAGE BUFFER
MACHINE TOOL CONTROL CIRCUITS
MACHINE TOOL
MANUALLY CONTROLLABLE DATA TERMINAL

series at the rate of utilization of said blocks by the output device. A machine tool may be connected on line and controlled by the computer simultaneously with the editing or tape preparation operations thereof, and the machine tool may be controlled manually from a data terminal on line with the computer when the terminal is not in use for tape preparation.

3,816,724

SYSTEM FOR WELDING CONTROL

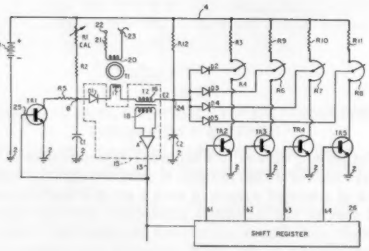
Fitzwilliam Allan Wentworth, Mosman, Australia, assignor to Cutler-Hammer Inc., Milwaukee, Wis.

Filed Sept. 18, 1972, Ser. No. 289,807

Claims priority, application Australia, Sept. 22, 1971, 6380/71

Int. Cl. G06g *7/66*; **H03k** *17/30*

U.S. Cl. 235—151.1 **11 Claims**



A control system for timing the occurrence and duration of functions occurring in a sequence in an industrial process, in which a single RC charging circuit initiates an output signal from a voltage comparator when its charged voltage exceeds the voltage also applied to the comparator from one of a plurality of resistive circuits which are assigned to respective functions and selectively connected one at a time to the comparator in accordance with the function sequence.

3,816,725

MULTIPLE LEVEL ASSOCIATIVE LOGIC CIRCUITS

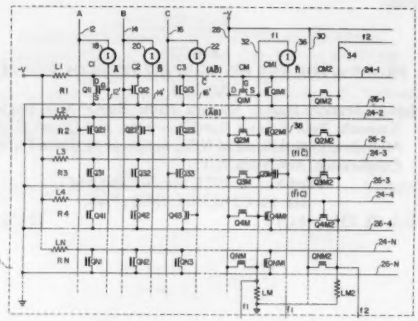
David L. Greer, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,572

Int. Cl. G06f *7/38*

U.S. Cl. 235—152 **21 Claims**

Disclosed are universal associative logic circuits for use in designing logic systems. The logic circuits comprise an array of logic elements interconnected in a preselected configuration to implement logic in factored and unfactored form by generating single Boolean functions and complex groups of such functions having single and multiple outputs through multiple levels of combinational logic providing electrical



responses to signals applied to the circuit and to signals generated within the circuit. Sequential logic functions are generated by interconnecting the logic elements to form storage elements.

3,816,726

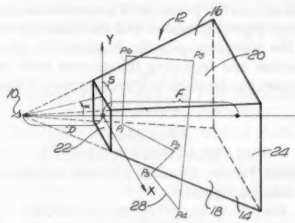
COMPUTER GRAPHICS CLIPPING SYSTEM FOR POLYGONS

Ivan E. Sutherland, and Gary W. Hodgman, both of Salt Lake City, Utah, assignors to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Filed Oct. 16, 1972, Ser. No. 298,084

Int. Cl. G06f *7/38*, *15/20*

U.S. Cl. 235—152 **19 Claims**

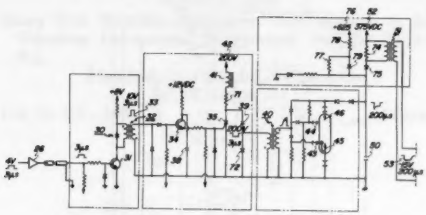


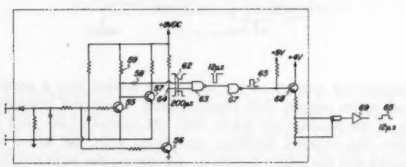
A system is disclosed for clipping three-dimensional polygons for use in a computer-graphics display. The system removes from each polygon all parts that lie outside an arbitrary, plane-faced, convex polyhedron, e.g. a truncated pyramid defining a viewing volume. The polygon is defined by data representing a group of vertices and is clipped separately in its entirety against each clipping plane (of the polyhedron). In a multiple-stage structure as disclosed, each stage clips the polygon against a single plane and requires storage for only two vertex values. A time-sharing embodiment of the system is also disclosed. The disclosed system also incorporates the use of a perspective transformation matrix which provides for arbitrary field-of-view angles and depth-of-field distances while utilizing simple, fixed clipping planes.

3,816,727
ECHO CHECK CIRCUIT

James J. McCann, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1972, Ser. No. 309,292
Int. Cl. G06k 5/00
U.S. Cl. 235—153 AS 9 Claims



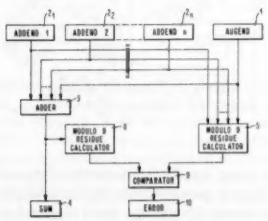


A non-impact computer output printer is disclosed wherein characters distributed about a rotating drum are projected to a xerographic drum by means including a row of flash lamps located inside the character drum. The echo check circuit is used for informing the controller unit issuing the commands to the flash lamps whether or not the lamps fired. In this way the integrity of the resultant printed matter is controlled. The echo check circuit includes noise isolating means for operating in the electrically noisy environment associated with flash lamps.

3,816,728
MODULO 9 RESIDUE GENERATING AND CHECKING CIRCUIT

Tien C. Chen, San Jose, Calif., and Irving T. Ho, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1972, Ser. No. 315,268
Int. Cl. G06f 11/10
U.S. Cl. 235—153 BD 25 Claims

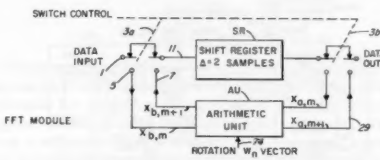


A modulo 9 residue generating and checking circuit for checking the accuracy of decimal addition operations in digital computers and other data processing equipment. A set of data words each representing a number to be added is transmitted to a multi-number adder which adds the words and provides a smaller set of words as a subtotal sum. The bits of the subtotal words are then divided into two groups. Each group of bits is fed to a respective modulo 9 residue generator which calculates the modulo 9 residue of the group. The two resulting residues are then fed to a third modulo 9 residue generator which calculates the modulo 9 residue of the sum of the two residues, thereby providing the modulo 9 residue of the sum of the original set of data words. This result may then be compared in the conventional manner with the modulo 9 residue of the sum resulting from the addition operation to be checked.

3,816,729
REAL TIME FOURIER TRANSFORMATION APPARATUS

George A. Works, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 863,776, Oct. 6, 1969, abandoned.
This application Nov. 24, 1971, Ser. No. 201,948
Int. Cl. G06f 15/34
U.S. Cl. 235—156 29 Claims



An apparatus for performing real-time Fourier transformation of a time varying signal by taking successive digital samples in a shift register means and repeatedly transforming preselected pairs of said samples as the samples are progressively shifted down the register. The successive samples are ordered in the register in a binary sequence from 0 to 2^n-1 while the pairs are selected when the binary distance between them is equal to 2^{n-m}, m being the transformation number, each pair $X_{a,m}$, $X_{b,m}$ being related to its transformed magnitude $X_{a,m+1}$ and $X_{b,m+1}$ by the relations

$$X_{a,m+1}=X_{a,m}+X_{b,m}e^{j\phi}$$

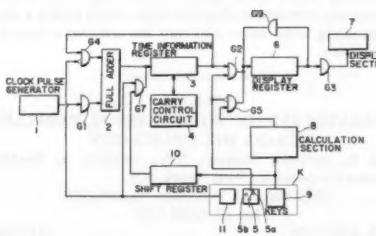
$$X_{b,m+1}=X_{a,m}-X_{b,m}e^{j\phi}$$

where ϕ is the radian value determined by the transform number m and the position of the sample pair $X_{a,m}$, $X_{b,m}$ in their original position order of succession.

3,816,730
ELECTRONIC CALCULATOR WITH AN INCORPORATED DIGITAL CLOCK

Mititaka Yamamoto, and Fumio Hayakawa, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 4, 1972, Ser. No. 294,771
Claims priority, application Japan, Oct. 4, 1971, 46-77759
Int. Cl. G06f 7/48; G04b 47/00
U.S. Cl. 235—156 1 Claim



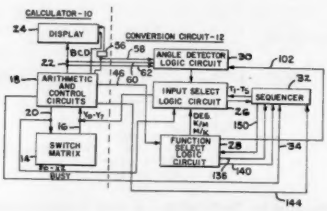
An electronic calculator incorporated with a digital clock, which comprises an arithmetical calculating section, a digital

clock section, a display section which is commonly used for displaying the result of arithmetic calculation performed by the calculating section and for displaying the time information yielded by the clock section and a switch for selectively bringing one of the sections into operation to permit the calculator to function as either a calculator or a clock in response to the operation of the switch.

3,816,731
CONVERSION APPARATUS UTILIZED WITH AN ELECTRONIC CALCULATOR

Rodney L. Jennings, Saratoga; Rodney J. Teets, and Perry L. Kerby, both of San Jose, all of Calif., assignors to Rodney L. Jennings, Saratoga, Calif., by said Teets, Kerby & Moss

Filed Feb. 20, 1973, Ser. No. 333,982
Int. Cl. G06f 7/48
U.S. Cl. 235—156 **7 Claims**



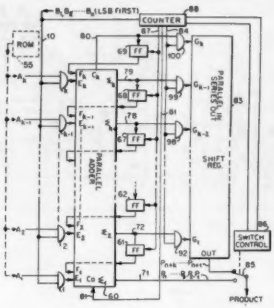
The apparatus of the present invention comprises a conversion circuit used in combination with a conventional electronic calculator for converting distance in units in one system to an equivalent distance in units in another system. Also, the conversion circuit converts the magnitude of an angle to the magnitude of its complementary angle. More specifically, the conversion circuit converts nautical miles to statute miles, statute miles to nautical miles, and the degrees of an angle to the degrees of its complementary angle. The conversion circuit supplies input signals to the arithmetic circuit of the calculator, which signals are equivalent to key input signals from the calculator's input switch matrix. The number to be converted is first entered on the calculator's keyboard and then an appropriate switch corresponding to the desired conversion is closed. The input signals to the arithmetic circuit of the calculator are generated by a logic circuit which is responsive to the closure of one of the conversion selection switches. A sequencer circuit controls the logic circuit to supply the desired signals corresponding to either an arithmetic function or a numeral in proper sequence to the calculator. An angle detector circuit determines the magnitude of the angle entered in degrees on the calculator's keyboard. If it is less than 180°, the logic circuit effectively enters an addition function and then 180°. If it is 180° or more, the logic circuit effectively enters a subtraction function and then 180°. The conversion between statute miles and nautical miles is performed by either multiplying or dividing by a factor of 0.87. Each cycle is automatically terminated after the logic circuit enters a signal corresponding to an equal sign into the arithmetic circuit of the calculator.

3,816,732
APPARATUS AND METHOD FOR SERIAL-PARALLEL BINARY MULTIPLICATION

Leland B. Jackson, Monsey, N.Y., assignor to Rockland Systems Corporation, West Nyack, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,108
Int. Cl. G06f 7/39
U.S. Cl. 235—156 **11 Claims**

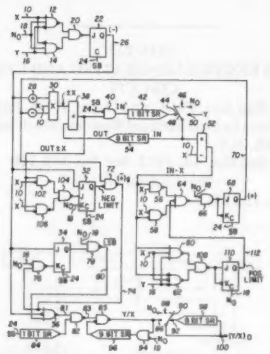
The bits of the multiplier are multiplied by sequential bits of the multiplicand in ascending order of significance. These sequential products are supplied to a parallel adder, where each bit is added to the delayed sum of the preceding operation of the next higher bit in order of significance, including the carry bit as the most significant. After k bits of multiplicand have been used, truncated or rounded output becomes available at the output of the least significant stage of the adder. During the bit interval of the last bit of the multiplicand the outputs of the adder are loaded into a parallel input series output shift register, after which the remaining bits of the product are taken from the output of the shift register, the delayed flipflops associated with the adder are cleared and the adder begins to operate on the next multiplication while the shift register is unloading.



3,816,733
BIT SERIAL DIVIDER WITH FULL SCALE CAPABILITIES

Delaine C. Sather, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed May 9, 1973, Ser. No. 358,574
Int. Cl. G06f 7/54
U.S. Cl. 235—164 **7 Claims**



A circuit using standardized components and providing a given word length quotient from the same length dividend and divisor. The circuit checks the input dividend and divisor for polarity and uses logic circuitry to determine if the quotient would be an improper fraction of either polarity. If an improper fraction did result, a given limit output of one polarity or the other is provided. Otherwise, the circuit operates in a normal long division process of examining the magnitude of each partial remainder in the division process, subtracting if the remainder is larger than the divisor, inserting a digit in the quotient upon each subtraction and increasing the value of the

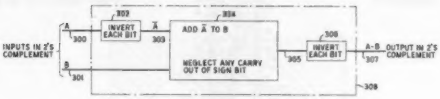
remainder for the next examination. The circuit operates with serial bit digit word format with the least significant bit of the digit word being supplied first both to and from the circuit.

3,816,734

APPARATUS AND METHOD FOR 2'S COMPLEMENT SUBTRACTION

Henry Tzvi Brendzel, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Mar. 12, 1973, Ser. No. 340,213
Int. Cl. G06f 7/385
U.S. Cl. 235—168 **4 Claims**



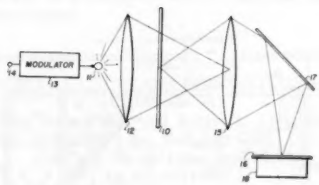
This invention is a method and apparatus for performing 2's complement subtraction. Each bit of the minuend is first inverted and then added to the corresponding bit of the subtrahend. Carries out of the most significant bit, the sign bit, are ignored. The resulting bits which have been added are then inverted, yielding the desired difference in 2's complement form.

3,816,735

MULTI-CHANNEL OPTICAL CORRELATOR SYSTEM

Keith Bromley, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 15, 1972, Ser. No. 234,749
Int. Cl. G06g 7/19, 9/00
U.S. Cl. 235—181 **10 Claims**



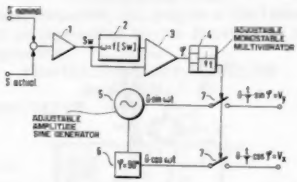
A multi-channel optical correlation system employs non-coherent light to illuminate a mask having a plurality of linearly disposed channels, each of which has recorded information defined by variations in opacity along its linear length. The non-coherent light source is modulated as a function of an unknown input signal and an image of the illuminated mask is formed in a selected image plane. The transmitted image is swept along the axes of the linearly disposed channels in synchronism with the time period of the unknown input signal and means is provided for temporally integrating the light intensity of the swept image along the linear length of each channel. A peak intensity of illumination within any of the channels of the resultant integrated image of the mask at the image plane indicates substantial correlation of the input signal with the recorded information in that particular channel.

3,816,736

ARRANGEMENT FOR CONVERTING POLAR COORDINATE SERVO ACTUATING SIGNALS INTO RECTANGULAR COORDINATE ACTUATING SIGNALS

Holger Krohn, Wombach, Germany, assignor to G. L. Rexroth GmbH, Lohr/Main, Germany

Filed Nov. 3, 1972, Ser. No. 303,632
Claims priority, application Germany, Nov. 6, 1971, 2155267
Int. Cl. G06g 7/22
U.S. Cl. 235—186 **9 Claims**



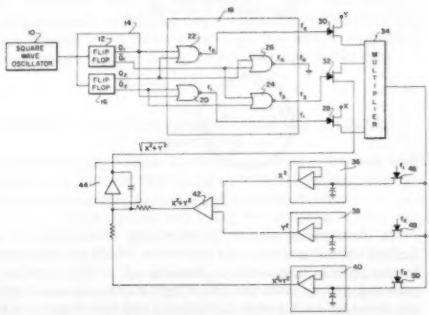
An arrangement for use in servo systems, particularly copying-machine and duplicating milling machine servo systems, is operative for accepting an input signal representative of the angular deviation of a polar-coordinate controlled variable from a reference angle and converting such input signal into two rectangular-coordinate actuating signals having proportional-plus-integral characteristics. A generator generates a sine wave and a cosine wave having a frequency f_1. A switch when triggered permits transmission of the instantaneous values of the sinusoids. A comparator has an output, a first input and a second input and triggers the switch when equal signals are applied to the comparator inputs. A frequency transducer has an output connected to said first input and has an input, and is operative for producing a sawtooth waveform whose frequency departs from f_1 in dependence upon an applied signal and whose frequency is equal to f_1 when the applied signal is zero. The aforementioned input signal is applied to the second comparator input and also to the input of the frequency-transducer.

3,816,737

VECTOR SUMMER CIRCUIT USING TIME SHARING

William H. Licata, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1973, Ser. No. 349,874
Int. Cl. G06g 7/16, 7/20, 7/22
U.S. Cl. 235—192 **9 Claims**



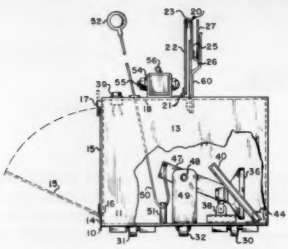
An analog multiplier for providing an output equal to the vector sum of two d.c. input voltages. The multiplier is mul-

tiplexed to provide the square of each input d.c. voltage and the square root of the sum of the two squared voltages.

3,816,738
CONVERTIBLE FLOOR SANITARY INSPECTION DEVICE

William B. Clancy, 5606 Rolling Ridge Dr. East, San Antonio, Tex. 78228

Filed Feb. 27, 1973, Ser. No. 336,232
Int. Cl. F21l *1/00*
U.S. Cl. 240—2.18 **5 Claims**

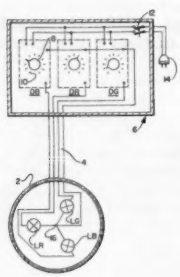


A self-contained, portable inspection device adapted to convert from the carrying position to the inspection position. The device comprises a power supply, diagonally diposed mirrors, and a light means mounted in an enclosed case with self-contained casters, a telescopingly combined carrying and control handle, and mirror positioning source constituting a device particularly suited to inspect food storage and warehouse facilities.

3,816,739
ILLUMINATING DEVICE

Michael Stolov, 25 Hapoel St., N of Yam, Herzilya, Israel

Filed Aug. 21, 1972, Ser. No. 282,613
Int. Cl. A47g *33/00*; F21p *3/00*
U.S. Cl. 240—10 R **6 Claims**

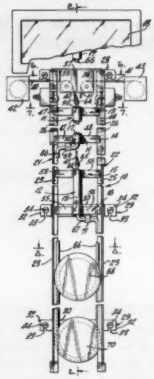


An illuminating device for providing illumination of any desired colour, intensity and saturation, which may be remotely controlled, comprises a housing of matte transluscent material, one or more groups of light sources disposed within the housing, each group including a red light source, a blue light source and a green light source and light dimmers for individually controlling the intensity of each of the light sources to thereby select the colour and intensity of illumination of the device.

3,816,740
UNDERWATER LIGHTING SYSTEM

Viggo Bech Rambusch, New York, N.Y.; Howard H. Oldenburg, Lebanon, and Peter White, Montclair, both of N.J., assignors to Rambusch Decorating Company, New York, N.Y.

Filed Apr. 2, 1973, Ser. No. 346,753
Int. Cl. F21v *31/00, 21/20*
U.S. Cl. 240—26 **7 Claims**

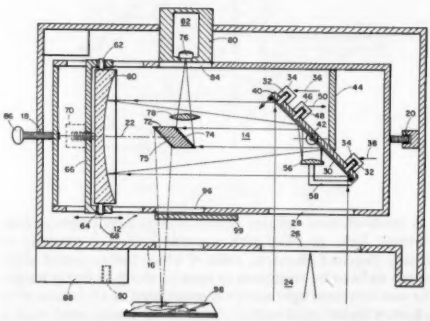


An underwater lighting system embodying sets of tracks attached to a wall in overlying spaced relationship, light supporting carriages engaging said sets of tracks, and raised and lowered by winches and electric cables disposed between the tracks for lighting each lamp.

3,816,741
INFRARED SCANNING SYSTEM

Thomas F. Macall, Sunnyvale, Calif., assignor to Midland Capitol Corporation, New York, N.Y.

Filed Aug. 4, 1971, Ser. No. 169,004
Int. Cl. G01t *1/16*
U.S. Cl. 250—347 **21 Claims**



An optical scanning system particularly suited to detecting infrared radiation and selectively operative either as a camera or as a microscope in response to a simple adjustment. A single folded optical system is employed having a multiply reflecting horizontal scanning mirror oscillatory about a first axis to provide line scanning, and a vertical scanning mirror oscillatory about an orthogonal axis at a lower frequency to provide frame scanning. The focal point of the optical path is fixed while the field of view can be rotated in elevation or

azimuth so that an orientation sensitive infrared detector may conveniently be used at the focal point. The oscillatory motion of each scanning mirror is preferably achieved by balanced forces oppositely acting at opposed edges of the scanning mirrors for providing efficient linear scanning with minimum bending distortion.

3,816,742

NEUTRON SPECTRUM STANDARD

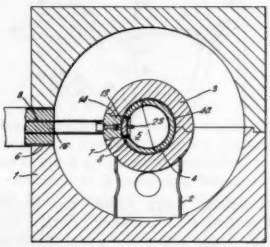
Colin Bowden Besant, Marlow, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 4, 1972, Ser. No. 277,975

Claims priority, application Great Britain, Aug. 6, 1971, 37185/71

Int. Cl. G21g *3/04*

U.S. Cl. 250—499 **9 Claims**



In order to carry out experiments and to make measurements of a fast neutron flux it is desirable to have an enclosure, accessible from outside, in which a fast neutron flux of fairly consistent spectrum can be produced, using any convenient irradiation source. The invention provides this apparatus which comprises concentric inner and outer hollow spheres of, respectively, natural uranium and of boron carbide, so that on irradiation in a thermal flux, fast neutrons emanating from the UNAT appear within the inner sphere to the exclusion of thermal neutrons, which are absorbed by the boron carbide sphere. The interior of the latter forms an enclosure in which experiments can be introduced and mounted conveniently on a composite closure plug, which protrudes into the enclosure.

3,816,743

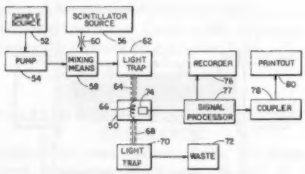
SCINTILLATION COUNTING SYSTEMS AND COMPONENTS

Philip Ting, Brea, Calif., and Robert L. Litle, assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 30, 1971, Ser. No. 176,135

Int. Cl. G01t *1/20*

U.S. Cl. 250—106 SC **14 Claims**



Scintillation counting systems employing a permanently connected flowpath for introducing and removing mixtures of fluid scintillator and sample must be protected against admission of light and ultra-violet rays to the scintillation sensor through the flowpath. The invention provides an improved protection arrangement including a light trap which is a trap for light and a conductor for fluids. The use of two of those light traps, one upstream and one downstream from the sensor, are combined with a novel mixer to provide a continuous flow monitoring counter in which mixing of sample and scintillator and their introduction to the mixer can be visually monitored without introduction of outside light to the sensor.

3,816,744

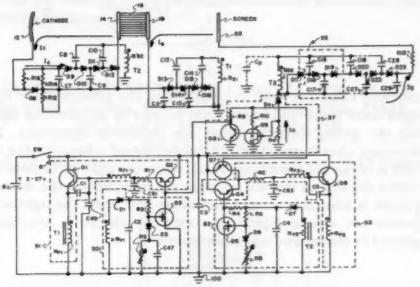
FAST RESPONSE AUTOMATIC BRIGHTNESS CONTROL CIRCUIT FOR SECOND GENERATION IMAGE INTENSIFIER TUBE

Sen-Te Chow, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 5, 1973, Ser. No. 403,728

Int. Cl. H01j *31/50*

U.S. Cl. 250—213 VT **3 Claims**



A fast response automatic bright source protection circuit for an image intensifier tube in which the amount of screen current, which is produced according to the light intensity of a target source, is sensed at the gate electrode of a junction FET. The gate electrode of the junction FET is connected between a resistor and a low junction capacitance diode that are serially connected in the path of the screen current. Since the diode has a very low junction capacitance, any fluctuation in the screen current has a very short transient time at the gate electrode of the junction FET. The drain electrode of the FET controls the drive of voltage regulated oscillators. The voltage regulated oscillator outputs are transformer coupled to voltage multipliers whose outputs produce large direct current bias voltages that are applied to the cathode, to the input and the output electrodes of a microchannel plate, and to the screen. These bias voltages applied to the input and output electrodes change inversely with any change of the screen current. Therefore, with the microchannel plate bias voltages varying inversely with the screen current, the brightness of the target source being viewed through the image intensifier remains constant at the output of the image intensifier tube.

3,816,745

OPTICALLY-COUPLED SENSING AND CONTROL SYSTEM

Raymond Primm; William L. McKeown, both of Roswell, and James S. Copeland, Dexter, all of N. Mex., assignors to Innovation Industries Incorporated, Roswell, N. Mex.

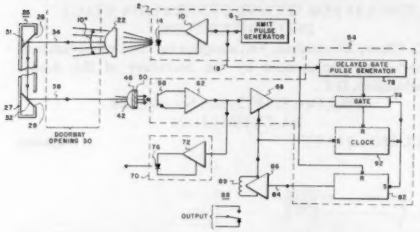
Filed Nov. 20, 1972, Ser. No. 307,974

Int. Cl. H01j *39/12*

U.S. Cl. 250—221 **17 Claims**

In an optically coupled sensing and control system, a train of light wave pulses are generated and directed along a first pathway in a first direction with the light wave pulses in said pathway diverging by a predetermined amount. Reflector apparatus receives the light wave pulses in said first pathway and directs the received pulses in a second direction opposite the first direction along a second pathway spatially displaced from

the first pathway. Detection apparatus is positioned in the second pathway to detect whether the light waves in either the first or second pathway are interrupted. When light wave pulses are detected by the detection apparatus, an enabling signal is generated and then applied via gating circuitry to memory circuitry. The gating circuitry opens for a predetermined period of time after each light wave pulse is generated to allow any enabling signal to pass to the memory circuit. The



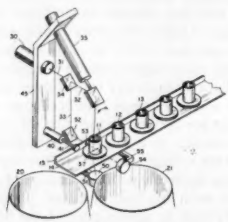
memory circuit is reset in response to the generation of each light wave pulse and is set upon receipt of an enabling signal via the gating circuitry from the detecting apparatus. The memory circuit generates an output signal whenever the circuit is in the set condition. Thus, when the light wave pulses in either the first or second pathway are interrupted, the memory circuit is placed in a reset condition and when the light wave pulses are uninterrupted, the memory circuit is alternately placed in the set and reset conditions.

3,816,746

APPARATUS FOR INSPECTING HARDWARE ITEMS

George Gugliotta, Ridgefield, Conn., and David M. Bradt, Tarrytown, N.Y., assignors to Laser Sciences, Inc.

Filed Apr. 6, 1973, Ser. No. 348,516
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 R **9 Claims**



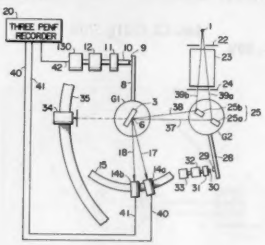
An apparatus for automatically examining the surfaces of hardware items progressing along a track toward a first receiving location and for urging the items toward a second receiving location when a specified surface condition is detected; viz., the absence of threading. In accordance with the invention, means are provided for determining the entry of a hardware item into a predetermined examination position along the track. Further means are provided for directing a beam of light toward the examination position. A photodetector is disposed to detect the light reflected from the surface of the item at the examination position. Also, deflection means are positioned alongside the track and are responsive to the output of the photodetector to deflect the items toward the second receiving location. In the preferred embodiment of the invention the photodetector is positioned approximately in the path of the beam when assuming the beam to have been reflected off a smooth unthreaded surface. In this preferred embodiment an occurrence indication is generated when the output of the photodetector exceeds a predetermined threshold level. The deflection means is then responsive to this occurrence indication.

3,816,747

METHOD AND APPARATUS FOR MEASURING LATTICE PARAMETER

Seigo Kishino, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1972, Ser. No. 257,554
Int. Cl. G01n *23/00*
U.S. Cl. 250—276 **28 Claims**



Two characteristic X-ray beams are irradiated on a specimen for detection (a specimen crystal), the difference $\Delta\Theta$ between the Bragg angles of the two characteristic X-ray beams diffracted from the specimen crystal is measured, and the lattice parameter d of the specimen crystal is calculated from the relational equation:

$$d = \frac{1}{2}\left[\lambda_1^2 + \left(\frac{\lambda_2 - \lambda_1 \cos \Delta\Theta}{\sin \Delta\Theta}\right)^2\right]^{1/2}$$

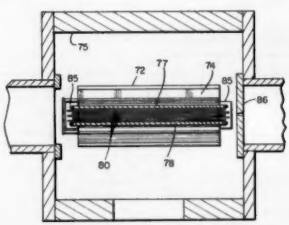
In comparison with a prior-art method which evaluates the lattice parameter from the Bragg diffraction condition, the lattice-parameter measuring method of this invention may eliminate the difficulty of the zero-point setting at measuring Bragg diffraction angles and renders angles to-be-measured small, so that the measurement accuracy of the lattice parameter may be enhanced.

3,816,748

ION ACCELERATOR EMPLOYING CROSSED-FIELD SELECTOR

Stanley Harrison, Bedford, Mass., assignor to Alpha Industries, Inc., Woburn, Mass.

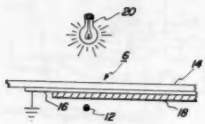
Filed Apr. 28, 1972, Ser. No. 248,417
Int. Cl. H01j *39/34*
U.S. Cl. 250—296 **7 Claims**



In the ion accelerator disclosed herein, the desired ion species is selected by means of a filter or selector of the crossed-field type which is self-focusing on at least one axis and which permits ion energy to be easily varied while maintaining focus

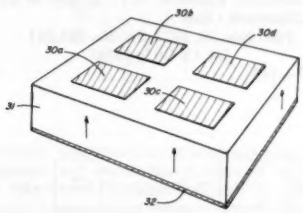
and desired species selection. In the selector, the electric field provided has a strength which, on the centerline of the beam, is proportional to the square-root of the ion energy and has a gradient, in the direction of the field, which is proportional to the ion energy.

3,816,749
EXPOSURE CONTROLLED CORONA DEVICE
Arthur J. North, 53 Dorset St., Rochester, N.Y. 14609
Filed Nov. 15, 1972, Ser. No. 306,766
Int. Cl. G03g *15/00*
U.S. Cl. 250—324 **2 Claims**



A corotron is disclosed herein in which the surrounding shield is coated with a photoconductive insulator. The extent to which the shield is grounded is controlled by the extent to which it is subjected to illumination. When the shield is illuminated and fully grounded, the corotron operates in the manner known to the prior art. When the corotron is in darkness and therefore not grounded because of the photoconductive insulator, charge accumulates on the shield causing the corona wire to stop emitting.

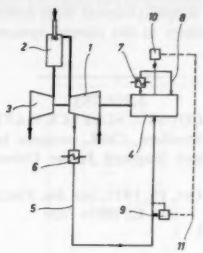
3,816,750
PYROELECTRIC DETECTOR
Sie T. Liu, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 150,872, June 4, 1971, abandoned. This application Jan. 11, 1973, Ser. No. 322,816
Int. Cl. G01t *1/16*
U.S. Cl. 250—338 **53 Claims**



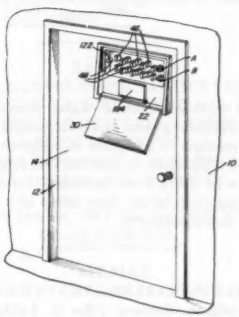
A pyroelectric detector is formed by a hot-pressed ceramic body of ferroelectric Lead Lanthanum Zirconate Titanate (PLZT) having the formula $Pb_{1-x}La_x(Zr_yTi_z)_{1-x/4}O_3$.

3,816,751
APPARATUS FOR COOLING AN ELECTRICAL GENERATOR
Ulrich Jampen, Birr, and Tadeusz Zaba, Wettingen, both of Switzerland, assignors to Brown, Boveri & Company Limited, Baden, Switzerland
Filed Oct. 30, 1972, Ser. No. 301,721
Claims priority, application Switzerland, Nov. 8, 1971, 16194/71
Int. Cl. H02k *9/00*
U.S. Cl. 290—2 **7 Claims**

A gas driven turbo-generator set including a compressor for the working medium fed to the turbine to drive the generator and compressor and wherein the generator is cooled by circulating the working medium through it from an extraction point on the compressor.



3,816,752
DOOR LOCK PUSH-BUTTON CONTROL STRUCTURE
Charles M. Goodwin, Rt. No. 2, Mount Vernon, Ohio 43050
Filed June 19, 1973, Ser. No. 371,418
Int. Cl. H02j *7/00*
U.S. Cl. 307—66 **15 Claims**



A push-button switch assembly is provided and includes one or more banks of push-button switches. Each switch includes a switch body shiftable between first and second limit positions and a third intermediate position. Each switch also includes a switch actuator also shiftable between first and second limit positions and a third intermediate position. A pair of push-buttons is provided for each switch and each pair of push-buttons is operable to shift the corresponding switch actuator between the first and second limit positions thereof. The switch bodies each include a pair of spaced terminals and the switch actuators each include terminal bridging means for bridging the corresponding terminals when the actuator is in a position thereof corresponding to the position of the associated switch body. In the instant invention, the switch assembly is disclosed as operatively associated with a door latch operating mechanism of the solenoid type and selected switches of the bank of switches may be operatively associated with the door latch operating mechanism and must have a proper button actuator thereof depressed in order to enable the door latch actuator to operate. Any of the switches not operatively associated with the door latch operating mechanism may be connected to suitable alarm systems, porch lights, and warning systems in an adjacent neighbors house, or remote police station. Also, the door lock push-button control is adapted for actuation not only by house current, but also includes a provision whereby a battery may be positioned in place from outside the associated door and electrically connected to the

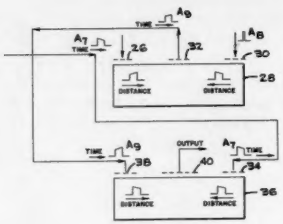
push-button control assembly in the event of failure of the domestic house current, the insertion of a battery into its proper position automatically opening the circuit by which the switch is normally supplied current from domestic supply and connecting the battery to the control system in lieu of the domestic current.

3,816,753

PARAMETRIC ACOUSTIC SURFACE WAVE APPARATUS

Gordon S. Kino, Stanford, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 18, 1971, Ser. No. 190,342
Int. Cl. H01v *7/00*
U.S. Cl. 307—88.3 **2 Claims**



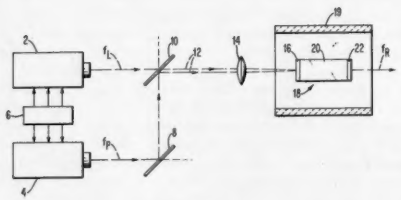
Parametric surface acoustic wave apparatus including means for establishing two acoustic surface waves in a piezoelectric medium in a fashion to establish the conditions for parametric interaction so that various functions of signal processing can be carried out including, for example, signal convolution and correlation, time delay and time inversion, amplification, and oscillation.

3,816,754

TUNABLE INFRARED/ULTRAVIOLET LASER

Rodney T. Hodgson, Somers; John R. Lankard, Mahopac; Peter P. Sorokin, White Plains, and James J. Wynne, Montrose, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,307
Int. Cl. H03f *7/00*
U.S. Cl. 307—88.3 **14 Claims**



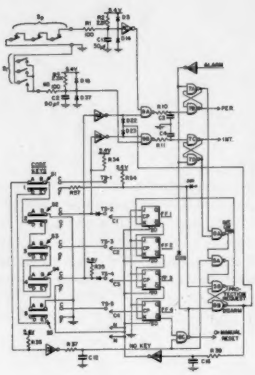
An infrared source producing a coherent output having a spectrally narrow and continuously tunable frequency is described. Such a source uses a four wave mixing process in an alkali metal vapor, wherein the initial input beams to the alkali metal vapor come from two dye lasers. In an alternative mode of operation, tunable ultraviolet output is obtained.

3,816,755

CIPHER LOCK

Richard Louis McMaster, Rochester, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

Filed May 9, 1973, Ser. No. 358,493
Int. Cl. E05b *49/00*
U.S. Cl. 307—115 **4 Claims**



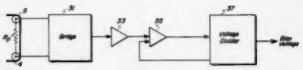
An electronic cipher lock in which the same switches which are used to enter the unlocking code can be used to serve additional switching functions.

3,816,756

AUTOMATIC BIAS CONTROL

Herbert L. Bresnick, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1972, Ser. No. 307,911
Int. Cl. G03g *15/00*
U.S. Cl. 307—149 **7 Claims**



In an electrostatographic process recorder utilizing coated paper whose resistivity changes as a function of relative humidity, control apparatus for varying the process bias voltage in accordance with the resistivity of the paper in order to maintain a constant image quality.

3,816,757

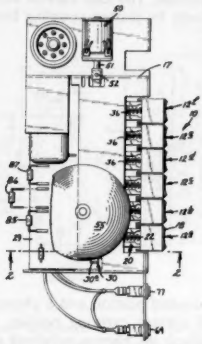
TIMER SWITCH APPARATUS

Jon L. Otterlei, 4704 Meroiane, Edina, Minn. 55436

Continuation of Ser. No. 252,212, May 11, 1972. This application June 6, 1973, Ser. No. 367,483
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **3 Claims**

A timer switch including a plurality of separately depressible push button switches each electrically connected to a dif-

ferent RC timing circuit. Each timing circuit is connected in electrical parallel to an electrically energizable solenoid



operatively attached to a release bar for releasing a depressed push button upon energization of the solenoid through the timing circuit associated with the depressed button.

3,816,758

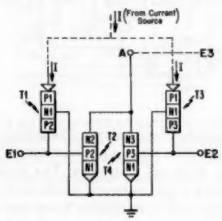
DIGITAL LOGIC CIRCUIT

Horst Heinz Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 134,008, April 14, 1971, Pat. No. 3,736,477. This application Mar. 15, 1973, Ser. No. 341,424

Int. Cl. H03k *19/40, 19/34*

U.S. Cl. 307—214 **17 Claims**



A monolithic semiconductor circuit comprises a lateral PNP transistor and an inversely operated vertical NPN transistor. The lateral transistor is formed by a pair of mutually spaced P-type regions diffused in an N-type semiconductor body. The collector region has diffused therein a region of N-type and constituting the collector of the vertical transistor. The semi-conductor body constitutes the base region of the lateral transistor and the emitter region of the vertical transistor.

3,816,759

DIVIDER CIRCUITS

Brian Shepherd, Witney, England, assignor to Smiths Industries Limited, London, England

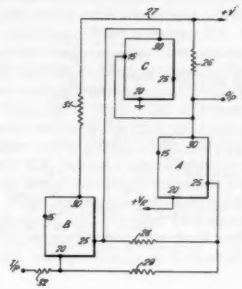
Filed May 12, 1972, Ser. No. 253,034

Claims priority, application Great Britain, May 17, 1971, 15345/71

Int. Cl. H03k *23/22, 23/30*

U.S. Cl. 307—225 B **10 Claims**

A divide-by-two divider circuit comprises first, second and third switch means each having a pair of regeneratively interconnected transistors. The first and second switch means are arranged to switch from a non-conductive state to a conducting state in response to, respectively, the application of, and the cessation of, a first of two successive input signals. The third switch means responds to the application of the second



signal to switch from a non-conducting state to a conducting state and to initiate switching of the first and second switch means back to the non-conducting state, and the third switch means reverts to its non-conducting state in response to the cessation of said second signal.

3,816,760

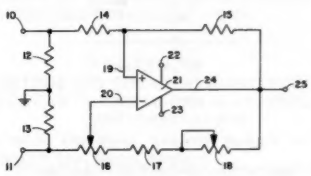
VARIABLE LEVEL NOISE BARRIER CIRCUIT RESPONSIVE TO A BIPOLAR INPUT AND HAVING VARIABLE BIPOLAR HYSTERESIS AND HAVING A BIPOLAR OUTPUT

Richard S. Slawson, Barrington, R.I., and Alfred Nazareth, Jr., Rehoboth, Mass., assignors to G. W. Dahl Co., Inc., Bristol, R.I.

Filed Oct. 26, 1971, Ser. No. 192,137

Int. Cl. H03k *5/20*

U.S. Cl. 307—235 R **6 Claims**



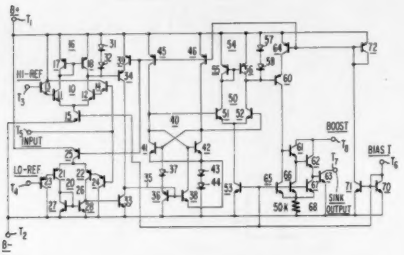
A noise barrier circuit employs an amplifier in a bridge circuit having positive and negative feedback paths in two of the bridge legs. When the bridge is balanced, the feedback paths mutually cancel, and the circuit operates as an open-loop amplifier. When the bridge is unbalanced, a hysteresis effect is produced by the difference in feedback effects, and unwanted signals within the bipolar hysteresis levels are not passed to the output of the noise barrier circuit. The hysteresis effect is adjustable to desired levels by the degree of bridge imbalance. A modification permits unbalancing the bridge functionally by varying the amount of feedback in one of the feedback paths rather than varying a bridge leg resistance, thereby providing for improved d-c stability. The noise barrier circuits operate upon bipolar inputs and produce a bipolar output.

3,816,761

COMPARATOR CIRCUITRY

Adel Abdel Aziz Ahmed, Clinton Twp., County of Hunterdon, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,634
Int. Cl. H03k 5/20, 3/12
U.S. Cl. 307—235 R 13 Claims



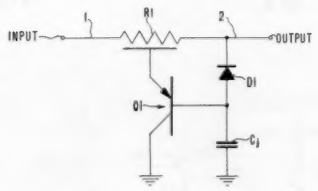
A dead-zone comparator includes first and second component voltage comparators used respectively to compare an input signal to a high reference level and to a low reference level, which reference levels may be programmable. A bistable is set by the output signal of one comparator and reset by the output signal of the other. These SET and RESET signals are opposite polarity currents, one of which is more severely constrained in value than the other, and are applied via a common SET-RESET buss to the bistable.

3,816,762

NOISE SUPPRESSION CIRCUIT

James G. Holt, Jr., Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 2, 1973, Ser. No. 320,406
Int. Cl. H03k 5/08; H04b 15/00
U.S. Cl. 307—237 19 Claims



A noise suppression circuit comprising a transistor connecting the input lead of a working circuit to ground has a diode interconnecting its base and emitter regions to allow charge stored on the base-collector junction capacitance of the transistor to rapidly discharge after the disappearance of a noise signal.

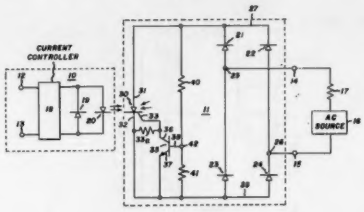
3,816,763

ZERO VOLTAGE SWITCHING PHOTON COUPLED RELAY

Sebald R. Korn, Auburn; Richard W. Fox, Marcellus, and William H. Sahm, III, Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 2, 1972, Ser. No. 293,816
Int. Cl. H03k 17/00
U.S. Cl. 307—252 UA 6 Claims

A solid state relay or controlled switch which may be utilized in place of an electromechanical relay to conduct AC power from a source to a load. The solid state relay includes a load current carrying portion and a control portion which has complete and permanent electrical isolation from the load current carrying portion. The load current carrying portion is controlled exclusively by photon coupling between a photon



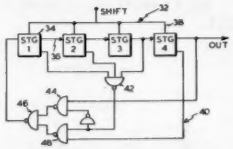
generator in the control portion and a photon-activated element in the load current carrying portion. A variable impedance device affects the photon switching sensitivity of the photon-activated element and provides the logic necessary for switching at essentially a zero voltage.

3,816,764

BINARY SEQUENCE GENERATOR

Claude F. King, Rolling Hills, Calif., assignor to Receptors, Redondo Beach, Calif.

Division of Ser. No. 149,513, June 3, 1971. This application May 1, 1972, Ser. No. 249,420
Int. Cl. H03k 21/00
U.S. Cl. 307—260 2 Claims



An address generator for applying a sequence of address bit signals a communication channel to successively define a plurality of different multi-bit addresses. The address generator includes a sequence logic network comprised of an N stage shift register which, with a minimum hardware configuration, produces an M-bit sequence defining 2^N unique N-bit subsequences. The minimum hardware configuration includes a feedback network for normally entering the complement of stage N into stage 1. When so doing would produce a repeat state, then instead, the output of stage N is entered into stage 1 without inversion. Thus, the feedback network need merely recognize when a repeat state is about to occur and abort it by forcing a previously undefined state.

3,816,765

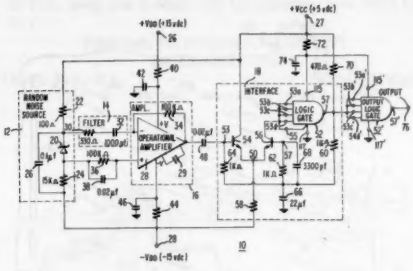
DIGITAL INTERFACE CIRCUIT FOR A RANDOM NOISE GENERATOR

Ronald Bruce Goyer, North Hollywood, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,444
Claims priority, application Great Britain, June 27, 1972, 30038/72
Int. Cl. H03k 5/00
U.S. Cl. 307—260 A 11 Claims

An interface circuit arrangement between a random noise generator circuit and an output digital logic integrated circuit. The interface circuit includes a digital logic integrated circuit which has impedance levels and voltage levels compatible with that of the output digital logic integrated circuit and

which is connected within a closed loop including a differential amplifier which biases the interface digital logic integrated circuit into a symmetrical amplification region substantially midway within its linear range of operation thereby removing a threshold selectivity which otherwise reduces the randomness of the output of the random noise generator.



3,816,766

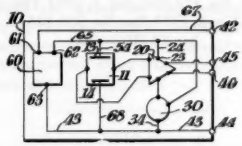
INTEGRATED CIRCUIT WITH HALL CELL

Robert A. Anselmo, San Jose, Calif.; Michael H. Oppenheimer, Williamstown, and Robert C. Genesi, Sterling, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jan. 29, 1973, Ser. No. 327,555

Int. Cl. H01v *5/00;* **H01l** *19/00*

U.S. Cl. 307—278 **7 Claims**



Described is an integrated circuit comprised of a hall cell, a differential amplifier and a current source; that operates as a sensitive magnetic-field-to-voltage transducer being essentially independent of ambient temperature changes.

3,816,767

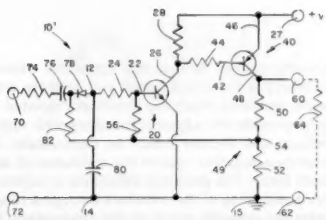
SCHMITT TRIGGER CIRCUIT

Kalju Meri, Maspeth, N.Y., assignor to Electrospace Corporation, North Bergen, N.J.

Filed Mar. 23, 1973, Ser. No. 344,124

Int. Cl. H03k *3/286, 3/295*

U.S. Cl. 307—288 **10 Claims**



A Schmitt trigger circuit has a complimentary set of normally non-conductive transistors. The first transistor is of the NPN type and the second transistor is of th PNP type. A single source of voltage energizes the circuit. The collector of the first transistor is connected to the base of the second transistor through a current limiting resistor. A feedback voltage divider connected to the collector of the second transistor has a center tap which is connected through a current limiting resistor to the base of the first transistor. The transistors are so arranged so that both transistors are normally non-conductive in the standby mode - this preventing a drain of current from the source of voltage. When a varying D.C. voltage applied to the base of the first transistor rises above a predetermined value, both transistors become conductive and the voltage between the collector of the second transistor and the ground reference potential of the circuit, to which an external load may be connected, switches from zero voltage to substantially the full power supply voltage. When the trigger circuit is utilized to sense A.C. voltages, a rectifier is provided at the input to the above described circuit, namely at the base of the first transistor, which first rectifies the varying or fluctuating A.C. voltages to varying D.C. voltages. A diode current return path resistor is connected between the diode and the center tap of the feedback voltage divider to further decrease switching times.

3,816,768

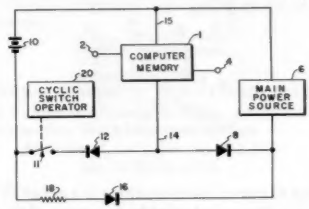
MEMORY PROTECTING CIRCUIT

Jeffrey P. Stein, Devon, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 16, 1972, Ser. No. 281,222

Int. Cl. H03k *1/02*

U.S. Cl. 307—296 **6 Claims**



A circuit for automatically connecting a temporary source of power to a memory system during failure of a primary power source for the memory system to provide low duty cycle current pulses to the memory system.

3,816,769

METHOD AND CIRCUIT ELEMENT FOR THE SELECTIVE CHARGING OF A SEMICONDUCTOR DIFFUSION REGION

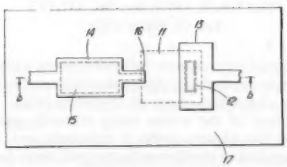
Brian Crowle, Dorchester, England, assignor to Integrated Photomatrix Ltd., Dorset, England

Filed Dec. 14, 1970, Ser. No. 97,495

Claims priority, application Great Britain, Dec. 17, 1969, 61483/69; Jan. 30, 1970, 4676/70

Int. Cl. H01l *11/14*

U.S. Cl. 307—304 **17 Claims**



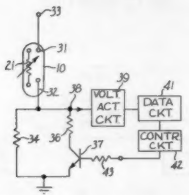
The disclosure relates to a method and a circuit element comprising a substrate of a first type of semi-conductive

material, having a diffusion region of opposite type of semiconductive material formed therein, a terminal for the substrate remote from the diffusion region, a gate region having a metallised region extending over a region of the substrate adjacent the diffusion region and insulated from the substrate by a layer of suitable insulating material, the arrangement being such that, on suitably biassing the circuit element and on applying suitable pulses to the gate region of the appropriate sign and of magnitude greater than the characteristic threshold voltage of the gate region, the diffusion region will acquire charge of one sign during fluctuations in gate metallisation potential towards one sign (e.g. negative going) and lose a smaller amount of such charge during such fluctuations in the opposite direction (positive going) thereby acquiring a net amount of charge of the one sign.

3,816,770
DATA INPUT DEVICE

Tadahiko Nakamura, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1972, Ser. No. 283,302
Claims priority, application Japan, Aug. 30, 1971, 46-66409
Int. Cl. H03k 7/00; H3k 17/06
U.S. Cl. 307—308 **11 Claims**



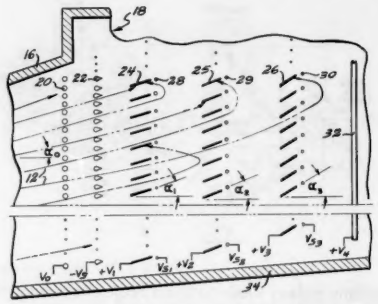
A circuit to obtain hysteresis effect in a switch by providing variable impedance controlled by movement of the switch actuator and incorporated in a coupling circuit between a voltage source and a switching circuit. When the voltage coupled from the source to the switching circuit is above a certain level, the coupling circuit has one transfer characteristic controlled by the switching circuit; when the voltage is below that level, the coupling circuit has a different transfer characteristic. The change in transfer characteristic as the coupled voltage passes through that level is such as to enhance the effect of coupled voltage change by a pre-determined amount so that additional reverse movement of the actuator will be required to reverse the status of the switching circuit.

3,816,771
PLASMA ENERGY TO ELECTRICAL ENERGY CONVERTER

Ralph W. Moir, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 9, 1973, Ser. No. 331,153
Int. Cl. H02n 4/00
U.S. Cl. 310—5 **5 Claims**

Plasma from a fusion reactor is directed along a straight-line path and then converted directly to electrical energy by means of a plurality of parallel arrays of "venetian blind" collector grids, the planes of the arrays being mutually parallel and transverse to the plasma path. A relatively low retarding potential is applied to the first collector grid array for collecting low-energy ions, while successively higher retarding potentials are applied to each succeeding grid array for collecting ions of corresponding higher energy. The angles of the "venetian blind" grid arrays are adjusted to make them highly transparent to oncoming particles and highly opaque to particles

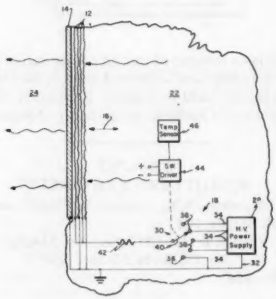


that pass through but have insufficient energy to reach the next grid array and so return to and are collected by the preceding grid array.

3,816,772
ELECTROSTATIC CONTROL METHOD AND APPARATUS

Richard P. Clifford, Newport Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 214,900, Jan. 3, 1972. This application Jan. 2, 1973, Ser. No. 320,143
Int. Cl. H02n 1/00
U.S. Cl. 310—6 **4 Claims**



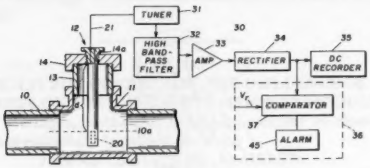
An electrostatic control method and apparatus wherein a potential difference is impressed across two or more electrically conductive members which are electrically isolated from one another to provide the adjacent members with opposite electrical polarity and thereby create an electrostatic force urging the members together against the resistance of an opposing resilient force. The potential difference is adjusted to effect relative positioning of the members through a range of positions under the conjoint action of the electrostatic force and the opposing force. The disclosed inventive embodiment is a thermal barrier composed of multiple thermal insulating layers which are electrostatically positioned to regulate the thermal conductance of the barrier.

3,816,773

METHOD AND APPARATUS FOR DETECTING PARTICULATE MATERIAL IN FLOW STREAM

Willett F. Baldwin, Dallas, and Lynn D. Mullins, De Soto, both of Tex., assignors to Mobil Oil Corporation, New York City, N.Y.

Filed Oct. 12, 1972, Ser. No. 297,097
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 24 Claims



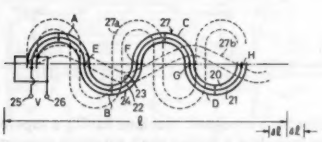
A system for detecting the presence of particulate material, e.g., sand, in a fluid stream flowing through a conduit, said system comprising an acoustical probe which is positioned directly into the flow stream. The probe has a housing in which a transducer, e.g., piezolectric crystal, is suspended. The housing is filled with oil to acoustically couple the transducer to the housing. Particulate material in the flow stream gives up kinetic energy upon striking the housing of the probe which in turn excites the transducer to generate an output signal having a frequency component which is representative of the particulate material. The system includes circuitry which amplifies and filters the output signal to provide a processed signal corresponding to said frequency component and which includes means for utilizing said processed signal, e.g., an alarm activated when a certain sand content condition in the flow stream is exceeded.

3,816,774

CURVED PIEZOELECTRIC ELEMENTS

Katuhiro Ohnuki, Tokyo; Kazuhiro Sato, Yamato-City; Shin Miyajima, Sagamihara-City, and Hideo Suyama, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama City, Kanagawa-ken, Japan

Filed Jan. 29, 1973, Ser. No. 327,777
Claims priority, application Japan, Feb. 17, 1972, 47-19555; Jan. 28, 1972, 47-10402; Jan. 28, 1972, 47-10403; Jan. 28, 1972, 47-10404; Jan. 28, 1972, 48-10406; Jan. 29, 1972, 47-10790; Feb. 2, 1972, 47-11367; Feb. 29, 1972, 47-20241; Mar. 7, 1972, 47-23345; Mar. 14, 1972, 47-25278; Feb. 17, 1972, 47-19556
Int. Cl. H04r 17/00
U.S. Cl. 310—8.6 10 Claims



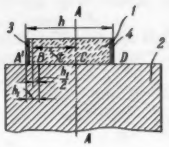
A curved piezoelectric element comprises at least one piezoelectric piece of sheet formed into a wave shape which deforms when a voltage is applied thereto. The wave shape of the piezoelectric piece comprises essentially at least two half-waves connected contiguously and consecutively in one body.

3,816,775

ELECTROMECHANICAL CONVERTER OF FLEXURAL VIBRATIONS

Mikhail Rashidovich Khaimov, Belovezhskaya ulitsa, 13, k. 69, Moscow, and Evgeny Mikhailovich Kheifets, ulitsa Gogolya, 17, kv. 7, Riga, both of U.S.S.R.

Filed Oct. 7, 1969, Ser. No. 864,502
Int. Cl. H04r 17/00
U.S. Cl. 310—9.6 2 Claims



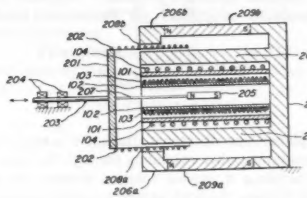
An electromechanical converter of flexural vibrations used, for example, in electromechanical filters in the field of radio engineering, comprising a disk-shaped resonating element and a transducer element for converting electrical vibrations into mechanical and mechanical vibrations into electrical, wherein said converter features increased stability to the effect of mechanical loads and is easily tuned to the desired frequency. The transducer element takes the form of a ring of piezoelectric material disposed on the periphery of the disc engaging asymmetrically with respect to a central plane of the disc which is transverse to the axis thereof. A manipulation of the extent of asymmetry and the axial dimension of the ring provides an optimal arrangement and a control on the parameters of the converter.

3,816,776

EXTERNAL MAGNETIC FIELD COMPENSATOR

Srinivasan V. Chari, Minneapolis, Minn., assignor to Control Data Corporation, South Minneapolis, Minn.

Filed Dec. 4, 1972, Ser. No. 311,585
Int. Cl. H02k 41/02
U.S. Cl. 310—13 5 Claims



An external fluctuating magnetic field may introduce errors in the signal produced by a signal winding, such as may be found in a magnetic transducer, even though the winding may be shielded by a flux shield. The subject of this invention, a compensating winding wound directly around the flux shield, can be made to produce a compensating signal which directly cancels the error component in the signal from the signal winding.

3,816,777

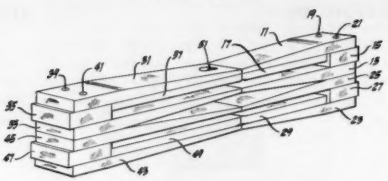
ELECTRODYNAMIC FORCE GENERATOR

Kenneth Joseph Metzgar, 1256 Longview Dr., Fullerton, Calif. 92631, and Frank Macomb Tillou, 1025 Hilda St., Anaheim, Calif. 92806

Filed Dec. 27, 1972, Ser. No. 319,020
Int. Cl. H02k 33/18
U.S. Cl. 310—13 6 Claims

There is disclosed an assembly of magnetic circuit structures each having a pair of pole pieces and a magnet, the pair

of pole pieces being spaced apart and separated by an elongated opening of uniform width into which the magnet is inserted, and attached to one of the pair of pole pieces, the width of the magnet being less than the width of the elongated opening to form a uniform air gap between the magnet and the other of the pair of pole pieces. A substantially uniform magnetic field is generated across the air gap and in which a multiplicity of electrically conductive turns of a movable coil are located, the coil being adapted to connect to a source of electrical current. The movable coil has a central opening therethrough adapted to receive the other of the pair of pole pieces whereby the movable coil is propelled along the air gap in response to a force generated by the uniform magnetic field upon the electrically conductive turns when an electrical current is conducted through the movable coil therethrough.



3,816,778

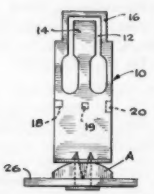
MOUNTING FOR MECHANICAL VIBRATOR

LaVerne L. Frey, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 23, 1972, Ser. No. 265,443

Int. Cl. H02k *33/00*

U.S. Cl. 310—25 **8 Claims**



Base of a planar type vibrator is attached to a mounting surface by a tension member extending through the base of the vibrator, controlling it against rotation around the tension member, and holding the base against a curved surface of an interposed elastomeric pad with a controlled degree of compression of the pad.

3,816,779

BISTABLE ELECTROMECHANICAL TRANSDUCER

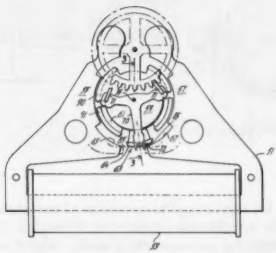
Robert S. Lundin, Thomaston, Conn., assignor to General Time Corporation, Thomaston, Conn.

Filed Mar. 29, 1973, Ser. No. 346,092

Int. Cl. H02k *33/16*

U.S. Cl. 310—37 **6 Claims**

A bistable electromechanical transducer is disclosed for converting low energy, low duty cycle electrical input pulses to mechanical motion. The transducer includes a stator which is formed of a core element having an energizing winding wound thereabout. The stator is separated at its ends to form a generally circular air gap with the ends of the stator forming a pair of pole faces. A rotor is positioned in the air gap and includes a permanent magnet sandwiched between two parallel discs of high permeability material. The discs each have a plurality of working rotor pole faces with one of the discs having an extra pole face designated the holding pole. The rotor holding pole, when in a central neutral position, extends into a channel formed by the separated ends of the stator core. As the rotor rotates toward either of its stable positions, the holding pole comes into increasing angular alignment with the respective portions of the stator core to which it is attracted, there being a substantially constant radial air gap separating the rotor holding pole and the stator. Because of the constant radial air gap, the holding pole is attracted toward either end of the stator core by a torque which is substantially constant as the rotor approaches either of its stable positions.



To prevent the rotor main poles from having any influence on the quiescent state of the rotor the total air gap permeance of the main poles is kept essentially constant over the entire stroke of the rotor. This is accomplished by extending the arc length of the rotor poles beyond the arc limit of the stator pole so that regardless of rotor position (within its design limits) the rate of change of fringing permeance of the "entering" pole is little different from that of the "leaving" pole except that it is opposite in sign.

These aforementioned features prevent the rotor from becoming locked in either bistable position or from becoming temporarily centered in an intermediate neutral position.

3,816,780

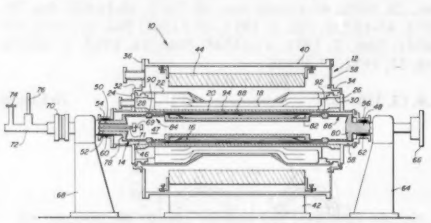
ROTOR STRUCTURE FOR SUPERCOOLED FIELD WINDING

Joseph L. Smith, Jr., Concord, and Philip Thullen, Dover, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 18, 1972, Ser. No. 281,816

Int. Cl. H02k *9/00*

U.S. Cl. 310—52 **23 Claims**



A rotor for a cryogenic machine having a supercooled field winding including a hollow shaft rotatably supported on axle means and having an internal vacuum chamber; a field winding structure having radial interstices and axial interstices; a field winding structure compartment carried by the shaft for supporting the field winding structure; low thermal conductivity interconnection means interconnecting the compartment with the axle means; at least one heat exchanger means including a first member in thermal communication with the interconnection means at a discrete position along the inter-

connection means for removing heat from the interconnection means and a second member including a first conduit in thermal communication with the first member for removing heat from the first member using supercooled fluid flowing through the first conduit at a temperature higher than that of the supercooled field winding; and a convection trap associated with each heat exchanger means including a second conduit interconnected with the first conduit and having a portion having a course extending from larger to small radius to trap the warmer less dense fluid nearer the center of the rotor and the colder more dense fluid nearer the periphery of the rotor to prevent centrifugal convection in the centrifugal force field of the rotor.

3,816,781

CIRCUIT FOR CORRECTING THE INFLUENCE OF VELOCITY ON AN INDUCTIVE POSITION TRANSDUCER

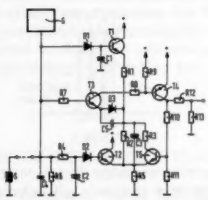
Albert Maringer, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munchen, Germany

Filed Apr. 24, 1973, Ser. No. 353,996

Claims priority, application Germany, Apr. 28, 1972, 2221695

Int. Cl. H03k *11/00*

U.S. Cl. 310—68 R **11 Claims**



A circuit for correcting the influence of velocity on the output signal of an inductive position transmitter of the type which comprises an armature moving relative to a sensor having an excitation winding, in which a trigger transistor is arranged to fire at a predetermined percentage of the maximum output voltage of the sensor and to turn off at another predetermined point to provide an output which is indicative of the zero crossing point of the armature and sensor.

3,816,782

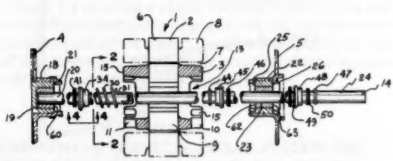
THRUST LOAD EQUALIZER FOR AN ELECTRIC MOTOR

Bobby F. Dow, Collinsville, Ill., and Herbert G. Fellner, Ferguson, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed July 10, 1972, Ser. No. 270,433

Int. Cl. F16c *17/04, 31/00*

U.S. Cl. 310—90 **14 Claims**



A motor has an improved thrust distribution system. A plurality of thrust bearing means are placed along the motor shaft to distribute the axial load during motor operation. One of the bearing means carries substantially the entire thrust load in a first axial direction along the motor shaft. At least two other bearing means distribute the thrust load in a second axial direction along the motor shaft. The last mentioned bearing means include a fixed bearing on a first end of the motor shaft and the floating bearing on the second end of the motor shaft which is spring biased to loading condition, thereby sharing the axial load with the fixed bearing.

3,816,783

COMPOUND SPRING ARRANGEMENT FOR BRUSH HOLDERS OF ROTARY ELECTRIC MACHINES

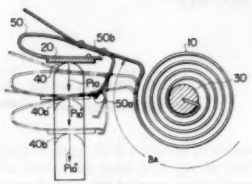
Toshio Nakamura; Yasuzi Sakuma; Hitoshi Egawa; Sadaharu Kawai, and Shoji Motegi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1971, Ser. No. 187,279

Claims priority, application Japan, Oct. 7, 1970, 45-87553

Int. Cl. H02k *13/00*

U.S. Cl. 310—246 **8 Claims**



Spring arrangement for the brush holders of a rotary electric machine. The spring arrangement is made by combining two kinds of springs, that is, a conventional spiral spring and a V-shaped leaf spring, in such a manner that the deflection angle of the V-shaped leaf spring opposes the deflection angle of the spiral spring so that the horizontal component of the pressing force of the spiral spring on the brush is cancelled by the horizontal component of the pressing force of the V-shaped leaf spring on the brush for all positions of the brush.

3,816,784

HIGH POWER ELECTRIC DISCHARGE LAMP WITH COOLED BASE ASSEMBLY

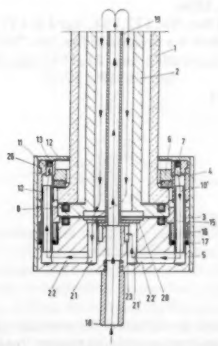
Gerhard Weninger, Munchen, Germany, assignor to Patent-Freuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munchen, Germany

Filed May 3, 1973, Ser. No. 356,912

Claims priority, application Germany, May 8, 1972, 2222454

Int. Cl. H01j *61/52*

U.S. Cl. 313—32 **14 Claims**



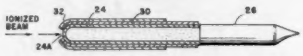
Fluid cooled high power discharge lamp, more particularly a high pressure xenon discharge lamp with a power input of more than 10 kW capable of being disassembled. A cooling

system is included in the base assembly. A clamping ring clamps a coupling flange in which a plurality of ducts and tubes for coolant are embedded; the coolant cools both the electrode and the lamp base assembly. Resilient packings are interposed between the component parts, in the vicinity of the ducts, to be cooled by the coolant.

3,816,785
DISPENSING TARGETS FOR ION BEAM PARTICLE GENERATORS

Charles G. Miller, Los Angeles, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 29, 1972, Ser. No. 267,572
Int. Cl. G21g *3/04*
U.S. Cl. 313—61 S **14 Claims**

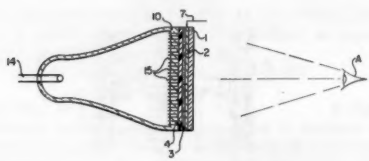


A target for dispensing high energy protons or neutrons or ionized atoms or ionized molecules is provided which comprises a container for the target gas, which is at atmospheric or higher pressure. The container material can release the target gas in the spot where the container is heated above a predetermined temperature by the impact of an ion beam where protons or neutrons are desired, or by electrons where ionized atoms or molecules are desired. On the outside of the container, except for the region where the beam is to impact, there is deposited a layer of a metal which is imperious to gaseous diffusion. A further protective coating of a material is placed over the layer of metal, except at the region of the ion impact area in order to adsorb any unreacted gas in the vacuum in which the target is placed, to thereby prevent reduction of the high vacuum, as well as contamination of the interior of the vacuum chamber.

3,816,786
DISPLAY DEVICE COMPRISING A PROFUSION OF NAKED DROPLETS OF CHOLESTERIC LIQUID CRYSTAL IN A SUBSTANTIALLY CONTINUOUS POLYMERIC MATRIX

Donald Churchill, Kettering, and James V. Cartmell, Dayton, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 132,884, April 9, 1971, Pat. No. 3,734,597, which is a division of Ser. No. 707,706, Feb. 23, 1968. This application Aug. 21, 1972, Ser. No. 282,881
Int. Cl. H01j *29/12*
U.S. Cl. 313—91 **5 Claims**

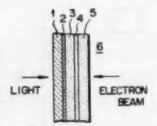


This disclosure is directed to articles of manufacture, chiefly display devices, containing minute "naked" droplets or inclusions of cholesteric liquid crystal material in a substantially continuous polymeric matrix, said liquid crystal material changing color or shade of color not only upon application of an electric potential but also upon removal of the field. The image produced has a comparable outline to that of the path of the electric field. Three chromatic states are evident, the normal color (before the electric potential is applied), the color given off when the electric field is applied, and the color observed when the electric field is removed. All three chromatic states are readily discernible from one another. The polymer matrix protects the cholesteric liquid crystal droplets from aging and enhances electric field behavior because the third chromatic state (electric potential removed) has a greater longevity with the matrix-bound material versus unprotected material of identical composition but no polymeric matrix. Other advantages are also discussed.

3,816,787
PHOTOCONDUCTOR COMPRISING CADMIUM SELENIDE

Kazuo Shimizu; Okio Yoshida, both of Yokohama; Kazuo Terakawa, Yokosuka, and Satoshi Aihara, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 17, 1971, Ser. No. 172,541
Claims priority, application Japan, Aug. 17, 1970, 45-71392
Int. Cl. H01j *39/66*
U.S. Cl. 313—94 **2 Claims**

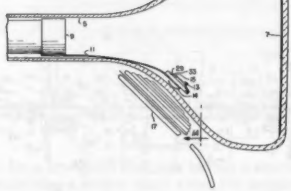


The photoelectric conductor device comprises a first layer of cadmium selenide or cadmium sulfoselenide, a second layer formed on the first layer and made of a substance containing cadmium salt of oxy-acid, and a third layer formed on the second layer, the third layer being made of a high resistance substance having a resistivity of more than 10^8 ohm-cm and being selected from the group of compounds not including cadmium selenide.

3,816,788
GETTER DEVICE

Clair W. Reash, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,617
Int. Cl. H01j *19/70*
U.S. Cl. 313—174 **3 Claims**



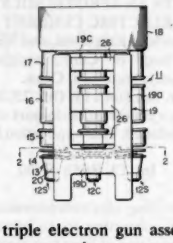
A getter assembly for use in a television picture tube comprising a receptacle containing getter material arranged on the inside surface of the funnel portion of the picture tube and having a cover member which is provided with deflecting members so as to prevent undesired deposition of getter material within the picture tube.

3,816,789

IN-LINE TYPE TRIPLE ELECTRON GUN ASSEMBLY

Shinichi Sawagata, Tokyo; Tokushirou Tanaka, and Humiyuki Sato, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Oct. 11, 1972, Ser. No. 296,598
Claims priority, application Japan, Oct. 14, 1971, 46-80533
Int. Cl. H01j *1/88, 29/50*
U.S. Cl. 313—243 10 Claims



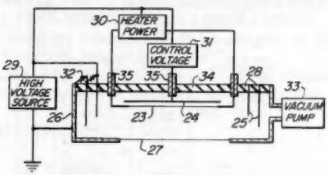
An in-line type triple electron gun assembly which comprises three electron gun members arranged in the same plane with the axis of the side gun members inclined at a predetermined angle to that of the central gun member; and support members fitted to the gun members for their integral assembly, said support member comprising two longitudinal elements each disposed between two adjacent gun members and at least one bridge element connecting said two longitudinal elements.

3,816,790

LINEAR CATHODE HIGH-ENERGY ELECTRON BEAM APPARATUS

Kazuo Arakawa, Toyonaka; Koichi Shinohara, Osaka, and Yasuhiro Shimizu, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 4, 1971, Ser. No. 150,018
Claims priority, application Japan, June 8, 1970, 45-49686
Int. Cl. H01j *29/46, 33/04*
U.S. Cl. 313—299 4 Claims



A linear cathode high-energy electron beam generating apparatus of the multi-stage acceleration type comprising a linear cathode for emitting a planar electron beam, and a plurality of cylindrical electrodes disposed one into another so as to surround the path of the planar electron beam, whereby the height of the generating apparatus is greatly reduced as compared with known electron beam apparatus.

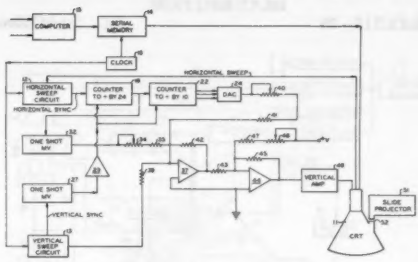
3,816,791

INCREMENTAL VERTICAL SWEEP SYSTEM FOR DISPLAY OF INFORMATION IN SELECTED HORIZONTAL BANDS ON A CRT

Dale A. Fluegel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1972, Ser. No. 316,919
Int. Cl. H01j *29/70*
U.S. Cl. 315—18 8 Claims

Information, such as process variables, can be displayed in selected vertically spaced horizontal bands on a cathode ray tube by employing means for modifying the waveform of the vertical sweep voltage to the CRT. In one embodiment a generally stairstepped waveform voltage is produced, with each vertical segment corresponding to the vertical spacing between adjacent horizontal bands. This stairstepped voltage is added to the generally sawtooth waveform of the conventional vertical sweep voltage. Spike pulses, corresponding to the completion of a horizontal band, can also be added to improve the movement of the electron beam to the next horizontal band. A slide projector can be employed to provide a graphic display of the process on the CRT, corrdinated with the positions of the information displays.

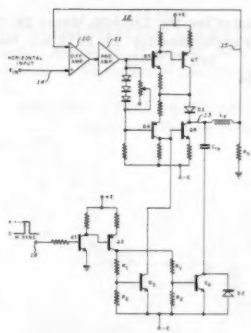


3,816,792

CATHODE RAY TUBE HIGH SPEED ELECTROMAGNETIC DEFLECTION SYSTEM

James M. Spencer, Jr., Phoenix, Ariz., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,473
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 TD 7 Claims



A cathode ray tube dual mode electromagnetic beam deflection control system including an amplifier for driving a deflection coil and means for switching between linear and resonant non-linear operational modes. In the linear mode, the yoke current is controlled to precisely follow an applied input deflection voltage by comparing the input voltage with a feedback voltage representative of the yoke current. In the non-linear mode, a capacitor is connected in circuit with the coil and the coil-capacitor circuit is simultaneously effectively disconnected from the amplifier output to enable resonant discharge between the coil and capacitor for fast beam retrace.

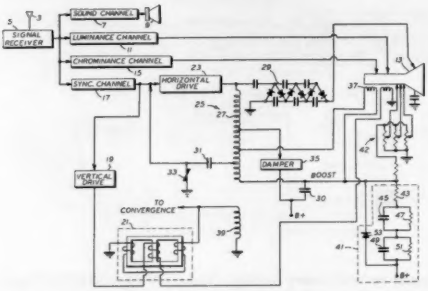
3,816,793
LOW FREQUENCY FILTERED POWER SUPPLY

Harry John Radloff, Williamsville, and George Cleveland Waybright, Oakfield, both of N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Continuation of Ser. No. 226,047, Feb. 14, 1972, abandoned. This application June 1, 1973, Ser. No. 366,181

Int. Cl. H01j *29/70*

U.S. Cl. 315—29 **4 Claims**



In a television receiver having a source of signals at a horizontal scan frequency and a cathode ray tube, a power supply means includes a flyback transformer coupled to the signal source, a voltage multiplier means coupling the transformer to the cathode ray tube, and a low frequency filtering means coupling the transformer to circuit ground whereby low frequency filtering is provided for relatively low value of beam current of the cathode ray tube and undesired bending of a scan raster is inhibited.

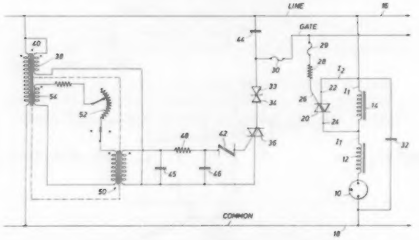
3,816,794
HIGH INTENSITY, GAS DISCHARGE LAMP DIMMER SYSTEM

Carl R. Snyder, Alief, Tex., assignor to Esquire, Inc., New York, N.Y.

Continuation of Ser. No. 238,800, March 28, 1972, abandoned. This application Apr. 23, 1973, Ser. No. 353,793

Int. Cl. H05b *41/38*

U.S. Cl. 315—194 **23 Claims**



A dimmer circuit for a high intensity discharge lamp system that controllably reduces the current through such lamps with consequent reduction in illumination thereof without causing cessation in the lamp current at any time. The circuit is controllable for changing the rms value of the lamp current without changing the slope of the lamp current as it goes through zero from one polarity to the other. A triac bypasses one of two ballast elements, connected in series, for varying the angles of conduction of the triac to control the rms value of the lamp current. The triac is fired from a gate source voltage in phase with line voltage, the amplitude of the gate source voltage being controlled by a zener diode, or other gate-signal control, device to properly time the turning on of the triac in relation to the lamp current. The zener diode, or other gate-signal control, device also prevents the triac from remaining conuctve past a time when there might be opposite polarity ballast-element voltage and lamp current.

3,816,795
METHOD FOR PROVIDING ELECTROLUMINESCENT LIGHT FROM A POLYCYCLIC HETEROCYCLIC COMPOUND IN AN APROTIC SOLVENT UNDER ELECTRIC CURRENT

Donald Leonard Maricle, Ridgefield, and Michael McKay Rauhut, Norwalk, both of Calif., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 504,111, Oct. 23, 1965, Pat. No. 3,654,525, which is a continuation-in-part of Ser. No. 382,408, July 13, 1964, abandoned. This application Dec. 13, 1971, Ser. No. 211,802

Int. Cl. H05b *43/00*

U.S. Cl. 315—246 **7 Claims**

Method for providing electroluminescent emission in an electrolytic cell by subjecting to an alternating current an electrolytic cell containing at least two electrodes in a mixture of (a) a substantially inert solvent, (b) a fluorescent organic polycyclic heterocyclic compound, and a supporting electrolyte.

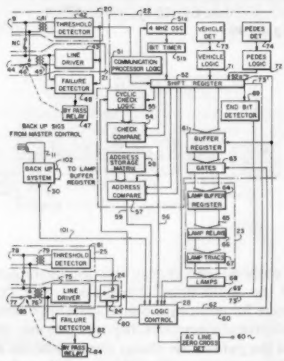
3,816,796
TRAFFIC SIGNAL CONTROL SYSTEM

Kenneth H. Molloy, Bedford; John P. Ward, Acton, and Mark Benson, Groton, all of Mass., assignors to Computer Systems Engineering, Inc., Billerica, Mass.

Division of Ser. No. 109,533, Jan. 25, 1971, Pat. No. 3,675,196. This application July 3, 1972, Ser. No. 268,614

Int. Cl. H05b *37/02*; **G08g** *1/095*

U.S. Cl. 315—287 **1 Claim**



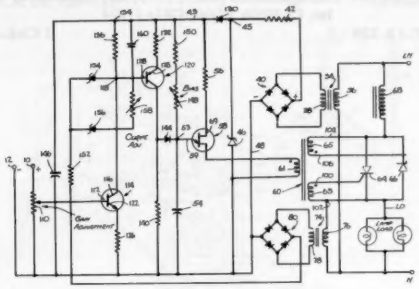
An automobile traffic signal control system controls traffic signals (lights) at a plurality of traffic intersections by way of a master controller which communicates with a local controller at each intersection and transmits pulse trains in sequence to the receivers at all the intersections, whereupon the intersection to which a specific pulse train is addressed stores the pulse train and uses each specific pulse in the train to control a specific light or signal at that intersection. In this manner, all lights and signals at all intersections are specifically each controlled by a specific pulse in a specific pulse train transmitted by the master controller to the local controllers at the intersections.

3,816,797

SOLID STATE ELECTRONIC DIMMER

Stephen J. Skirpan, New York, N.Y., assignor to Skirpan Lighting Control Corporation, Long Island City, N.Y.

Filed Nov. 15, 1972, Ser. No. 306,543
Int. Cl. G05f 1/20, 1/66
U.S. Cl. 315—291 9 Claims



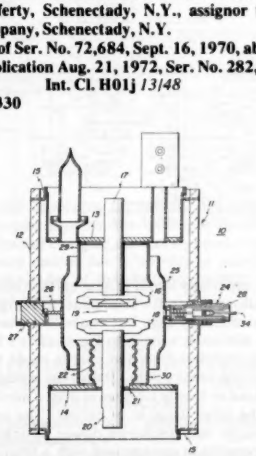
An improved solid state electronic dimmer circuit is disclosed for controlling the power input, i.e. the intensity of large electric lamps, such as theater and television lamps, using a low power control signal. The lamp control thus may be handled at a remote location. The improved circuit includes means for adjusting the transfer characteristics which adapt the circuit for use for the differing requirements of live stage lighting and television. Additionally, the circuit includes a biasing means permitting an adjustable low level lamp intensity to be maintained at zero input for certain operations, such as television use. The circuit also includes improved means for making the controlled lamp output independent of variations in the power line voltage as well as variations in the lamp loading. The circuit incorporating these improvements also is interference free so that it does not generate radio or other interference.

3,816,798

TRIGGERABLE VACUUM ARC DEVICE SUITABLE FOR ALTERNATING CURRENT OPERATIONS

James M. Lafferty, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 72,684, Sept. 16, 1970, abandoned.
This application Aug. 21, 1972, Ser. No. 282,606
Int. Cl. H01j 13/48
U.S. Cl. 315—330 1 Claim



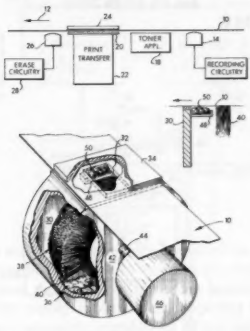
Triggerable vacuum arc devices are actuated by a single laterally disposed trigger assembly adjacent the arcing gap electrically isolated from the arc electrode when not actuated.

3,816,799

ELECTROSTATIC CHARGE ELIMINATION FOR MAGNETIC PRINTING SYSTEM

Owen J. Ott, Brookfield Center, and David W. Ginn, Newtown, both of Conn., assignors to Data Interface, Inc., Danbury, Conn.

Filed May 25, 1972, Ser. No. 256,993
Int. Cl. H05f 3/00
U.S. Cl. 317—2 R 5 Claims



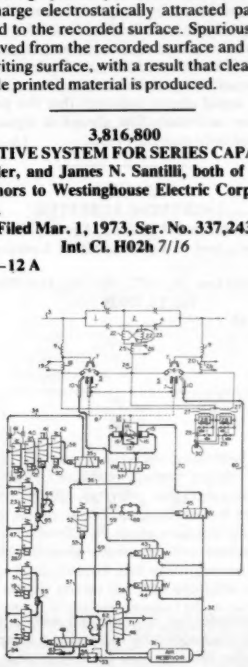
A technique and apparatus for removing electrostatically attracted magnetic toner particles from a recorded surface on which magnetic images are formed for magnetic printing. Magnetic toner powder is applied to a surface having magnetic images recorded thereon, the toner adhering to the recorded areas for subsequent transfer to a writing surface. An electrical discharge path is provided from the recording surface to discharge electrostatically attracted particles spuriously attached to the recorded surface. Spurious particles are thereby removed from the recorded surface and are not transferred to a writing surface, with a result that cleaner and more easily readable printed material is produced.

3,816,800

PROTECTIVE SYSTEM FOR SERIES CAPACITORS

Tim N. Ringler, and James N. Santilli, both of Bloomington, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1973, Ser. No. 337,243
Int. Cl. H02h 7/16
U.S. Cl. 317—12 A 8 Claims



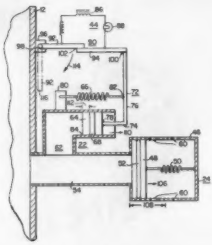
A protective system for series capacitors including a bypass switch device having pneumatic latching means to normally

hold the switch in open position, with an improved pneumatic control system for effecting release of the bypass switch under predetermined conditions.

3,816,801
ELECTRICAL TRANSFORMER

John Z. Almand, III, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1973, Ser. No. 322,829
Int. Cl. H02h *7/04*
U.S. Cl. 317—14 G **9 Claims**

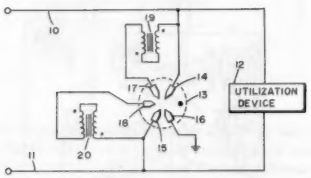


An electrical transformer comprising a pressure tight casing completely enclosing a magnetic core having windings thereon with a dielectric fluid at least partially filling the casing. Pressure developed within the casing by heating of the windings is sensed by pressure sensitive means. An electrical signal circuit is activated by the pressure sensitive means and indicates the pressure level within the casing of the transformer to a remote observer. When the pressure within the casing exceeds a certain predetermined value, pressure relief means is activated and permits escape of the excess pressure. The electrical signal circuit indicates that the pressure relief means has been activated. The electrical signal circuit will remain activated until manually reset.

3,816,802
LIGHTNING ARRESTER

Roy I. Crask, Edina, and William D. Egerer, Minneapolis, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed Dec. 26, 1972, Ser. No. 318,098
Int. Cl. H02h *3/22*
U.S. Cl. 317—16 **6 Claims**

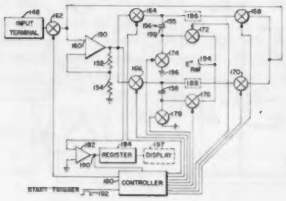


A step-up transformer is combined with a multiple-electrode gas-filled discharge tube to provide a pulse of sufficient magnitude to fire the tube and thereby protect a signal line and the equipment to which it is connected against voltage surges which may be harmful but which are otherwise too low to ignite the tube.

3,816,803
CHARGING A CAPACITOR TO REPRESENT SUM AND DIFFERENCE VOLTAGES

Bernard M. Gordon, Magnolia, Mass., assignor to Gordon Engineering Company, Wakefield, Mass.

Continuation of Ser. No. 82,139, Oct. 19, 1970, abandoned, which is a division of Ser. No. 843,485, July 22, 1969, Pat. No. 3,588,881. This application Feb. 7, 1973, Ser. No. 330,446
Int. Cl. H03k *17/00*; **G01r** *17/04*
U.S. Cl. 320—1 **1 Claim**

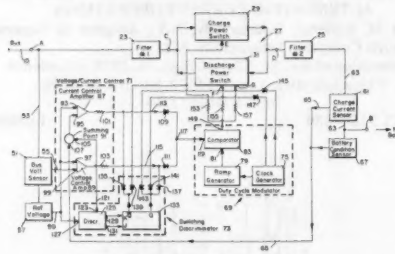


A method of charging a capacitor having a first signal applied to one terminal thereof, a unipolar reference signal and a ground signal operatively connected to another terminal thereof for providing bipolar reference signals from the unipolar reference signal by selectively applying the unipolar reference signal and the ground signal to the other terminal of the capacitor.

3,816,804
BILATERAL POWER CONDITIONER FOR SPACECRAFT

Gilbert I. Cardwell, Jr., Palos Verdes Peninsula, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 29, 1973, Ser. No. 365,296
Int. Cl. H02j *7/00*
U.S. Cl. 320—9 **12 Claims**



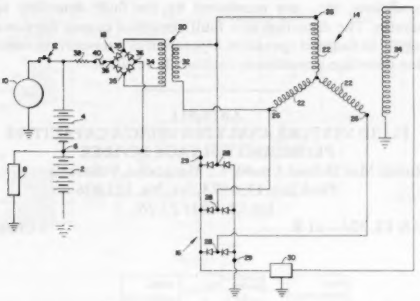
A system, especially useful in near earth orbiting spacecraft, that either allows the craft's solar panel to charge the vehicle's battery at a relatively high but controlled charge rate while supplying a minimum voltage to the satellite's bus-connected load, or that switches from the charge mode to a discharge mode so that the battery either shares the voltage supply function to the load or totally supplies at least a minimum bus voltage when the solar panel is in eclipse. The system includes separate charge and discharge power switches that are alternately operative in conjunction with a filter with switching periods determined by duty cycle modulator and depending for such alternate operation and switch periods on a control circuit which sense the bus voltage, the battery condition and the battery charge current.

3,816,805

DUAL BATTERY ELECTRICAL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Stanley M. Terry, Dayton, Maine, assignor to Maremont Corporation, Saco, Maine

Filed May 16, 1973, Ser. No. 360,908
Int. Cl. H02j 7/14
U.S. Cl. 320—15 14 Claims



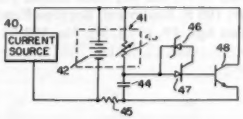
In a dual battery system for an internal combustion engine, as used in a vehicle or the like, wherein an auxiliary battery is connected in series with a service battery to provide a high battery voltage for a starter circuit, a charging means is provided for charging both the service battery and the auxiliary battery without changing their series connection. This charging means comprises an alternator, rectifier and voltage regulator for charging the service battery and an additional rectifier connected to the alternator through an isolation transformer for charging the auxiliary battery.

3,816,806

METHOD AND APPARATUS FOR CHARGING BATTERIES

Joseph A. Mas, 3 Maple Way, Woodbury, N.Y. 11797

Continuation of Ser. No. 35,352, May 7, 1970. This application Oct. 20, 1972, Ser. No. 299,255
Int. Cl. H02j 7/04
U.S. Cl. 320—20 20 Claims



A method and apparatus for rapidly charging a battery. During the charging process, the battery is caused to accept and store the desired charging current by producing discharge pulses whose rate and/or durations vary in accordance with the relative magnitudes of the charging current and the acceptance current level of the battery.

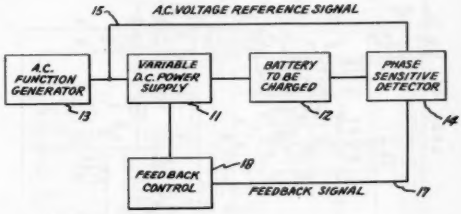
3,816,807

IMPEDANCE CONTROLLED BATTERY CHARGER AND METHOD OF CHARGING WITH MONITORING OF A.C. ANSWER SIGNAL

Dale F. Taylor, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 18, 1973, Ser. No. 380,134
Int. Cl. H02j 7/00; G05d 21/02
U.S. Cl. 320—20 10 Claims

A battery charger comprises a variable current DC power supply adapted to be connected across a secondary battery, an AC modulator connected to the DC power supply, a phase sensitive detector adapted for connection across the battery, AC voltage reference signal means connected to the phase sensitive detector, and means for monitoring the amplitudes of two different voltage components of the AC voltage appearing across the battery. An impedance controlled battery charger is



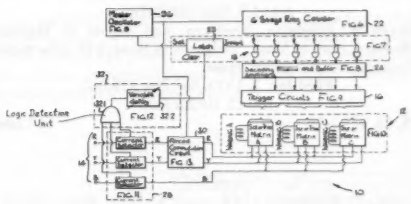
described in which the monitoring means of the above type of battery charger are provided in the form of a feedback control connected from the output of the phase sensitive detector to the DC power supply automatically adjusting DC current to match current accepting capabilities of the battery. Methods of battery charging are also described.

3,816,808

CHANGING THE FREQUENCY OF A POLYPHASE ALTERNATING CURRENT SUPPLY AND APPARATUS THEREFOR

Nicholas Charl de Villiers Enslin, Newlands, and John Austin Charles Chapman, Claremont, both of South Africa, assignors to Time Modulation (Proprietary) Limited, "Elim", Haut Bay, Cape Province, South Africa

Filed Sept. 20, 1972, Ser. No. 290,470
Claims priority, application South Africa, Oct. 7, 1971, 71/6729
Int. Cl. H02m 5/30
U.S. Cl. 321—61 11 Claims

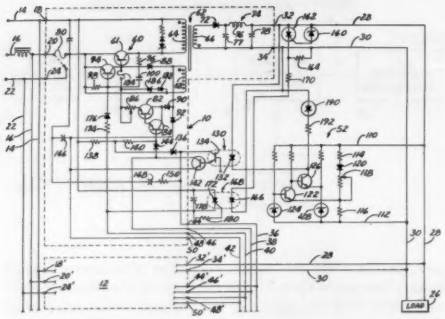


A method of and an apparatus for controlling the frequency of a polyphase alternating current supply applied to a polyphase load. SCR's or triacs are connected in matrices between each supply phase and each end of each load phase and selected sets thereof are made available for triggering in a predetermined stepping sequence. The current flow in the supply phases is monitored and when current zeros are detected in the supply phases the then available set of SCR's or triacs are triggered. If desired, current zeros can be induced in the supply phases. The frequency applied to the load is controllable by varying the rate at which the sets of SCR's or triacs are made available for triggering. The effective voltage applied to the load is also controllable by varying the time period between the detection of current zeros and the triggering of the sets of SCR's or triacs.

3,816,809
POWER SUPPLY HAVING IMPROVED OVER-VOLTAGE PROTECTION

Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Apr. 30, 1973, Ser. No. 355,632
Int. Cl. H02m *3/32*
U.S. Cl. 321—14 **8 Claims**

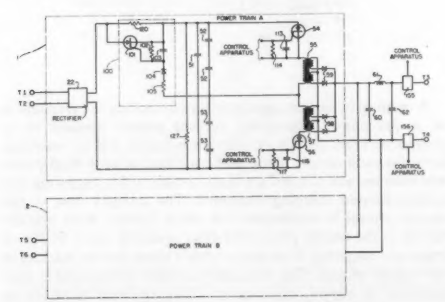


An efficient d-c to d-c converter power supply has over-voltage protection, the over-voltage protection circuitry being particularly applicable for use with power supplies having high current output characteristics. A reference voltage detecting device is connected to the high voltage load line as well as the control terminal of a thyristor device which is connected in series with a resistor across the load terminals so that when an over-voltage condition exists, the thyristor device is triggered into conduction, developing a voltage across the resistor which is applied to a circuit isolating device which has its output operably connected to the oscillator and shuts off the oscillator and power supply. Supplementary over-voltage protection circuits are included to provide protection against multiple failure of various components or portions of the circuitry.

3,816,810
HIGH CURRENT, REGULATED POWER SUPPLY WITH FAULT PROTECTION

Edward H. Friedman, Needham, and Albert M. Heyman, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1973, Ser. No. 320,041
Int. Cl. H02m *1/08*
U.S. Cl. 321—19 **14 Claims**



A power supply for providing a high current at a regulated voltage level while protecting the power supply from damage due to fault conditions. The power supply provides apparatus for rectifying AC input power and, by means of a DC to DC converter, supplies a DC voltage to the output terminal.

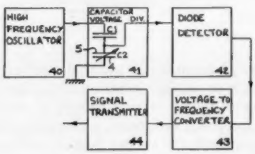
The DC output voltage is monitored by feedback circuits. The feedback circuits control the operation of switching elements of the DC to DC converter, and therefore determine the output voltage level, by increasing or decreasing the rate of operation of the switching elements.

Various fault conditions, such as over and under-voltage conditions, etc., are monitored by the fault detection apparatus. The detection of a fault condition causes the power supply to suspend operation. Operation of over-current condition detection apparatus is continually verified.

3,816,811
FLUID MIXTURE ANALYZER USING A CAPACITIVE PROBE AND VOLTAGE DIVIDER

Rudolf Max Helmut Cmelik K., Maracaibo, Venezuela

Filed Jan. 12, 1973, Ser. No. 323,026
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **9 Claims**

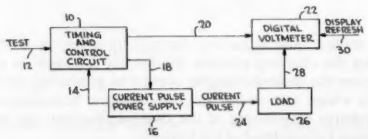


A sensor device for ascertaining water content of a petroleum flow in a well-pipeline including a capacitive sensing head between the plates of which the petroleum flows and an electrical assembly to measure the dielectric constant of the petroleum flow between the plates and to provide an output representing said dielectric constant which is indicative of the water content of the petroleum.

3,816,812
PORTABLE APPARATUS FOR MEASURING LOAD RESISTANCE

Glenn Alber, 905 N.W. 6th St., Boca Raton, Fla. 33432, and Carl H. Alber, 105 S. Boulevard, Boynton Beach, Fla. 33435

Filed Apr. 19, 1973, Ser. No. 352,611
Int. Cl. G01r *27/02*
U.S. Cl. 324—62 **15 Claims**

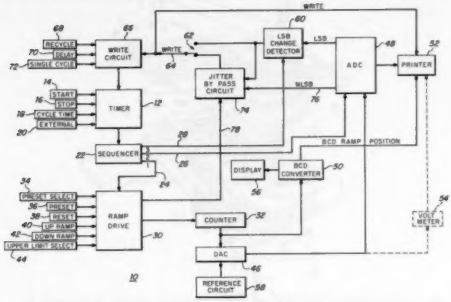


Portable apparatus for measuring the resistance of a load including a current pulse power supply generating a current pulse to be supplied to the load, a digital voltmeter for detecting the voltage across the load and displaying a digital signal representative of the resistance of the load and a control circuit operating the digital voltmeter only when the current pulse has a predetermined amplitude. The portable apparatus is particularly advantageous for measuring the resistance of circuit breaker contacts with current pulses having an amplitude of 100 amps.

3,816,813
AUTOMATIC CONVERTER TESTER

Robert Ramsay Jehu, Nashua, N.H., assignor to Spacetac Incorporated, Bedford, Mass.

Filed Jan. 24, 1972, Ser. No. 219,940
Int. Cl. G01r *1/02, 15/12*
U.S. Cl. 324—73 R **15 Claims**

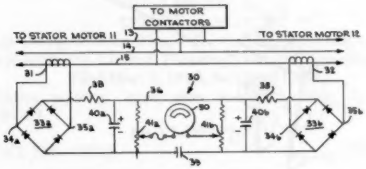


An automatic converter testing system including a digital-to-analog converter, means for providing a test input to the digital-to-analog converter, an analog-to-digital converter responsive to the output from the digital-to-analog converter, means for enabling the analog-to-digital converter to accept input from the digital-to-analog converter and produce a digital output as a function thereof, means for measuring the input to the analog-to-digital converter from the digital-to-analog converter, means for detecting a change in the digital output of the analog to digital converter, and means responsive to the means for detecting, for reading out the measured input and simultaneous output of the analog-to-digital converter, one of the converters being a reference instrument, the other being the instrument under test.

3,816,814
MAGNETIC PHASE DIFFERENCE METER

Charles O. Cooley, Rt. 2, Box 147, Alvin, Tex. 77511

Filed Apr. 2, 1973, Ser. No. 347,154
Int. Cl. G01r *25/00;* **H03d** *13/00*
U.S. Cl. 324—83 A **4 Claims**



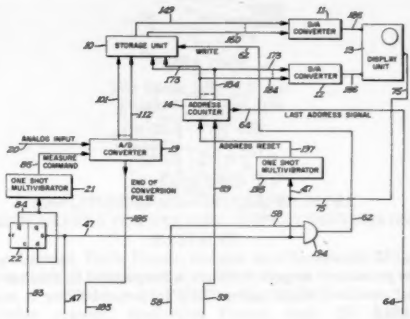
Circuitry for determining any magnetic phase difference, and direction of such difference, between coupled induction motors.

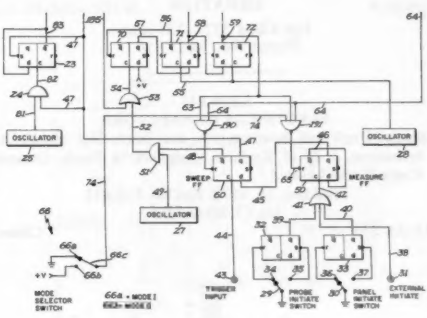
3,816,815
DIGITAL OSCILLOSCOPE AND METHOD OF STORING AND DISPLAYING WAVEFORMS

Robert W. Schumann, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed July 6, 1971, Ser. No. 159,817
Int. Cl. G01r *27/28*
U.S. Cl. 324—112 **15 Claims**

An oscilloscope, having a memory, converts incoming electronic impulses or waveforms into binary numbers and displays, measures and stores them. Provision is made for measuring, displaying and storing successive waveforms or for blocking incoming waveforms and observing the last-received, stored waveform repeatedly, at leisure. When observing the





stored waveform, provision is also made for admitting a single waveform from an outside source by the activation of a switch on the oscilloscope probe or on its panel or other remote location, or from an external signal. A novel method of storing and displaying waveforms is also disclosed.

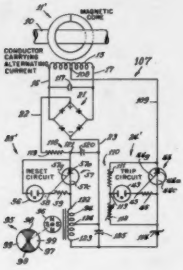
3,816,816
INDICATING AND AUTOMATICALLY RESETTABLE SYSTEM FOR DETECTION OF FAULT CURRENT FLOW IN A CONDUCTOR

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E. O. Schweitzer Manufacturing Co., Inc., Mundelein, Israel

Continuation-in-part of Ser. Nos. 873,393, Nov. 3, 1969, abandoned, and Ser. No. 55,532, July 16, 1970, abandoned. This application Aug. 7, 1972, Ser. No. 278,253
Int. Cl. G01r *19/16, 31/02*
U.S. Cl. 324—133 **13 Claims**

Fault current flow in a conductor above a predetermined value generates a magnetic field in one direction between the poles of a magnetic core while current flow below this value generates a magnetic field in the opposite direction. A permanent magnetic indicator is movable in response to these magnetic fields and remains in a corresponding position until acted on by the next change in direction of the magnetic field. The magnetic core has one or more pairs of poles and the per-

manent magnet indicator has a corresponding polar arrangement. The magnetic core has sufficient retentivity to maintain



the permanent magnet indicator in the position to which it was last operated when current flow in the conductor is interrupted.

ERRATUM

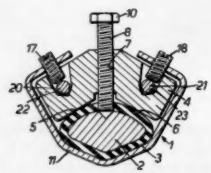
For Class 337—331 see:
Patent No. 3,815,816

3,816,817

ELECTRICAL CONNECTORS

Edmund Hugh Ball, Southampton, and James McConnell, Otterbourne, both of England, assignors to Pirelli General Cable Works Limited

Filed Dec. 15, 1972, Ser. No. 315,431
Int. Cl. H01r 7/04
U.S. Cl. 339—97 P **7 Claims**



An electrical connector for joining a branch conductor to an insulated mains conductor comprising a conductive collar for clamping about the mains conductor, means for connecting the branch conductor with the collar, and a screw engaged in the collar for screwing inwardly to penetrate the insulation on the mains conductor and make electrical contact with the core of the mains conductor. In one form of the invention one or more glass beads are formed on the inner surface of the collar opposite the screw so as to penetrate the insulation and abut the core when the screw is tightened against the core.

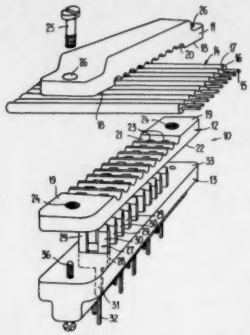
3,816,818

FLAT CABLE CONNECTORS

Hans Meier, Suhr, Switzerland, assignor to Sprecher & Schuh Aktiengesellschaft, Aarau, Switzerland

Filed July 13, 1973, Ser. No. 378,939
Claims priority, application Switzerland, Nov. 28, 1972, 17279/72
Int. Cl. H01r 9/06
U.S. Cl. 339—99 R **10 Claims**

A flat cable connector comprises two clamping members shaped to fit against opposite sides of a flat cable having parallel cores each embedded in its own cylindrical sheath of insulation. One of the clamping members is apertured and fixtures are provided for clamping the members together. A contact support, bearing piercing contacts, may then be drawn against



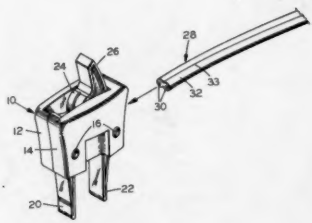
the apertured clamping member so that contact tines, provided on the piercing contacts, enter respective apertures and are forced through the cable insulation to make good electrical contact with the cable section clamped between the two members.

3,816,819

WIRE CONNECTOR WITH WIRE LOCATING DEVICE

Edwin B. Judd, East Greenwich, R.I., assignor to General Electric Company, New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 301,996
Int. Cl. H01r 11/20
U.S. Cl. 339—99 R **5 Claims**



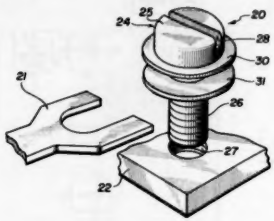
A wire connector with a wire locating device is provided and includes an insulating housing and a wire entry port in the housing to admit a pair of parallel stranded wires enclosed in an insulating sheath, the sheath having a cross-section of the general configuration of a figure 8 including opposed grooves. A wire passageway in the housing communicates with the wire entry port, and a pair of insulation penetrating contacts are stationed along the passageway and are pointed toward the passageway. Guide means are disposed in the passageway on at least one of the sides to cooperate with at least one of the grooves of the wire insulation to center the wire laterally in the passageway. Means are also provided for moving the wire relative to the wire penetrating contacts after the wire is centered.

3,816,820

PRE-ASSEMBLED TERMINAL SCREW AND WASHERS AND METHOD OF MANUFACTURE

Peter P. Stanaitis, Rockford, Ill., assignor to Textron Inc., Providence, R.I.

Filed Oct. 2, 1972, Ser. No. 294,258
Int. Cl. H01r 9/10
U.S. Cl. 339—263 R 7 Claims



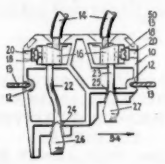
A threaded screw terminal for electrical connections and the like is provided which includes a screw member and at least two washers carried upon an upper portion of the screw member shank. When oriented in an upright position, the top washer is prohibited from dropping down the screw shank by a protuding ridge rolled into the shank. The bottom washer, however, is permitted to drop a limited distance away from the top washer and against the threads rolled into the lower portion of the screw member. The spacing thus created between the washers facilitates the attachment of an electrical wire, spade connector, or other connector to the terminal. The bottom washer can be urged into abutment against the connector (or against the top washer itself if no connector is present) by turning the screw member into an adjacent workpiece, thereby snugging the washers against one another, against any connector inserted between the workers, and against the screw head. In addition, a novel method of forming the fastener and the washer-retaining ridge on the screw member shank is described. A groove is formed in the shank, and the shank material displaced from the groove forms two adjacent ridges. The lower ridge is thereafter rolled back into the shank to permit the bottom washer to be snugged against the top washer.

3,816,821

TERMINAL BLOCK

David George Rhodes, Footscray, Victoria, Australia, assignor to Batebilt Pty. Limited, Footscray, Victoria, Australia

Filed Mar. 3, 1970, Ser. No. 15,988
Claims priority, application Australia, Mar. 7, 1969, 51621/69
Int. Cl. H01r 9/00
U.S. Cl. 339—198 R 15 Claims



Mating terminal blocks for mounting on the sides of sliding drawers and associated fixed walls to facilitate easy sliding connection or disconnection of the circuits in the sliding drawer. The contacts in the terminal blocks are staggered to facilitate mating engagement even though slight misalignments may exist and are of an especially compact configuration. They include grooves for easy mounting within simply shaped apertures.

ERRATUM

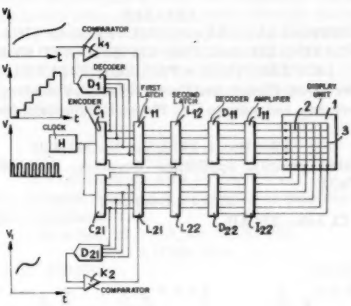
For Class 340—15 see:
Patent No. 3,815,704

3,816,822

AMPLITUDE-SPACE CONVERTER, MORE PARTICULARLY FOR DYNAMIC DISPLAY SYSTEMS ON MATRICES

Rene Auchapt, Paris, France, assignor to L'Equipment Et La Construction Electrique E.C.E., Paris, France

Filed Aug. 23, 1972, Ser. No. 283,211
Claims priority, application France, Sept. 28, 1971, 71.34781
Int. Cl. G01r 13/02
U.S. Cl. 340—324 M 6 Claims



A remote visual indicator of magnitudes includes an amplitude-space converter comprising at least one comparator having a first input receiving a voltage representing a magnitude, a second input receiving a stepwise varying voltage, and an output delivering, at the particular step-value at which the variable voltage attains the magnitude-representing voltage, a signal which is thus applied selectively to a line of same step-value on a display matrix.

3,816,823

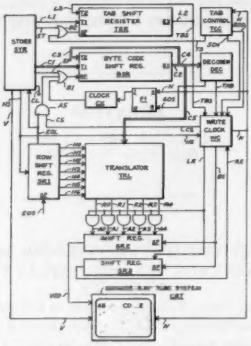
CHARACTER DISPLAY SYSTEM WITH TABBING FUNCTION

Solomon Manber, Sands Point, N.Y., assignor to Redactron Corporation, South Hauppauge, N.Y.

Filed Sept. 28, 1972, Ser. No. 293,011
Int. Cl. G06f 3/14
U.S. Cl. 340—324 AD 6 Claims

A character display system with tabulation facilities includes a display device such as a cathode-ray tube wherein signal codes representing characters are translated to signals for writing the characters along a line on the face of the cathode-ray tube. The signal codes are sequentially translated and transferred to the cathode-ray tube. During the course of

this sequential operation tab indicator signals are generated to interrupt the operation until tab positions indicator signals



CHARACTER DISPLAY SYSTEM

which are related to particular positions along the display line are sensed.

3,816,824

METHOD AND ARRANGEMENT FOR OPTICALLY DISPLAYING CHARACTERS CONSTITUTED BY RASTER LIGHT SPOTS ON A PROJECTION SURFACE

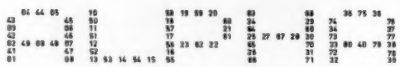
Walter Thust, Hasloh, and Uwe J. Schmidt, Pinneberg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1972, Ser. No. 311,420

Claims priority, application Germany, Feb. 18, 1972, 2207632

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 AD **2 Claims**



A method of increasing the flicker-free information in dynamic projection of image spots of an image in which the image-spot frequency is limited. The character forming raster of light spots consists of a meshed light spot series which is repeatable at approximately 50 times per second. The position of the first light series is chosen such that the full characters are visible after completion of all the series. Arbitrary energization of the separate image spots allows for a reduction of picture frequency and a flicker-free display.

3,816,825

DRIFT-COMPENSATED DOUBLE SAMPLING SEQUENTIAL FEEDBACK TYPE ENCODING SYSTEM

Haruo Kaneko; Yoshio Katagiri, and Tomonori Okada, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan

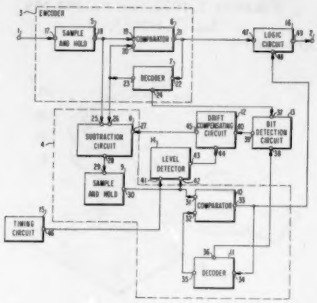
Filed May 15, 1973, Ser. No. 360,491

Claims priority, application Japan, May 18, 1972, 47-49727

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 AD **2 Claims**

A double sampling sequential feedback encoding system having means for compensating for drift in a subtraction circuit. The two encoders of a double sampling system have overlapping encoding ranges. The encoded bits from each encoder that correspond to the overlapped range are compared in a



monitoring circuit. Differences in the respective bits are detected as drifts and compensating voltages are generated and added to the sampled signal in the second encoder.

3,816,826

KEYBOARD SWITCH APPARATUS

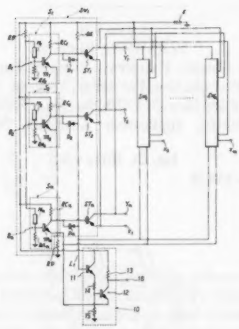
Noboru Masuda, Saitama; Masasi Kuroyanagi, Tokyo, and Takashi Matukawa, Kanagawa, all of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed June 25, 1973, Ser. No. 372,928

Claims priority, application Japan, June 23, 1972, 47-63602; Aug. 11, 1972, 47-80424

Int. Cl. H04l *15/06*

U.S. Cl. 340—365 E **16 Claims**

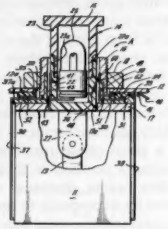


A keyboard switch apparatus which is adapted so that the switching means arranged in the matrix are actuated by operation of the switch circuits which are actuated by the keys, wherein each of said switch circuits is provided with a single auxiliary switch circuit which gives a hysteresis characteristic to said switch circuits.

3,816,827
ELECTRICAL CIRCUIT STATUS INDICATOR APPARATUS

Charles L. Lynn, Jr., 8225 Travelair Ave., Houston, Tex. 77017

Continuation-in-part of Ser. No. 133,554, April 13, 1971, abandoned. This application Apr. 12, 1972, Ser. No. 243,348
Int. Cl. G08b 5/36
U.S. Cl. 340—381 10 Claims

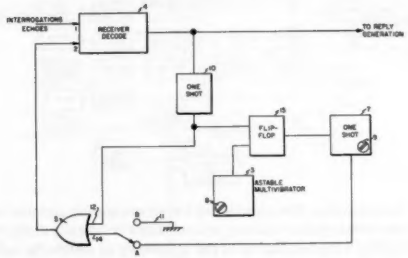


A new and improved circuit breaker status indicator apparatus to indicate that a circuit breaker from a plurality of circuit breakers has operated, and to identify which one of the circuit breakers has so operated. Push-to-test circuitry to monitor circuit continuity is included.

3,816,828
ECHO PROTECTION FOR TACAN/DME

Maurice L. Jezo, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 16, 1972, Ser. No. 253,715
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 LC 6 Claims



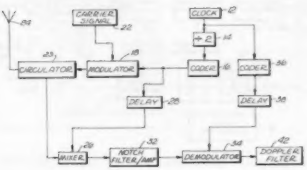
This invention relates to a method and apparatus for inhibiting the receiver of a Tactical Air Navigation (TACAN) system from responding to invalid interrogations (echoes). First and second dead time gates are generated. The second dead time gate has a fixed duration and is jittered within a predetermined time range. Each dead time gate is used to inhibit the beacon receiver from responding to an invalid interrogation.

3,816,829
PSEUDONOISE ECHO RANGING SYSTEM WITH IMPROVED RANGE RESOLUTION WITHOUT INCREASE OF TRANSMITTED CODE WORD REPETITION FREQUENCY

Francis J. O'Farrell, Valencia, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,087
Int. Cl. G01s 7/28, 9/12
U.S. Cl. 343—17.2 5 Claims

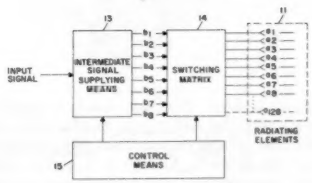
An echo ranging system comprising a code generator, the output of the code generator is used to bi-phase modulate a carrier frequency signal. The modulated signal is then transmitted towards a target from a system antenna. A return echo signal is delayed with respect to the transmitted signal by the effective target range. Further, the output of the code generator is delayed so as to be phase aligned with the transmitter leakage or spillover signal at a mixer. The code on the leakage signal is then removed and the carrier is attenuated in a notch filter. The coded echo signal is not reconstituted since it is not in time synchronization and is coded a second time at the mixer. With a round trip range equivalent to a half word code period, the doubly coded echo will appear as if it were generated by an oscillator at twice the frequency. The twice frequency coded echo signal then passes through the notch filter virtually uneffected and is coupled to a second receiver demodulator. The second input to the demodulator is the code originally generated but at a frequency twice that of the original coder clock frequency. The higher frequency coded echo is then demodulated.



3,816,830
CYLINDRICAL ARRAY ANTENNA

Richard J. Giannini, Setauket, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,195
Int. Cl. H04b 7/00
U.S. Cl. 343—100 SA 14 Claims

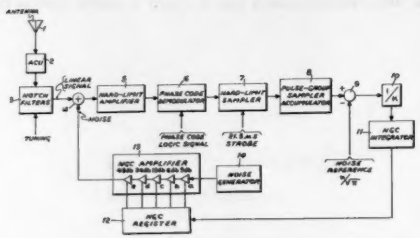


Disclosed is a cylindrical array antenna capable of radiating a beam which may be steered in coarse and fine increments to selectable beam positions. In a specific embodiment such an array comprises a plurality of radiating elements arranged in a circular configuration, a plurality of phase shifters which develops a group of intermediate signals having a selected phase distribution and suitable for radiation from the array and a switching matrix which accepts the group of intermediate signals and supplies them to a selected group of the radiating elements. The switching matrix and the phase shifters are electronically controlled so as to cause the beam to be steered to different positions, steering in coarse increments being accomplished by selecting different groups of elements and steering in fine increments being accomplished by selecting different phase distributions for the intermediate signals.

3,816,831
NOISE-DITHERED HARD-LIMIT LORAN C/D RECEIVER

Leonard D. Mollod, Kinnelon, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 24, 1972, Ser. No. 300,069
Int. Cl. G01s 1/20
U.S. Cl. 343—103 5 Claims

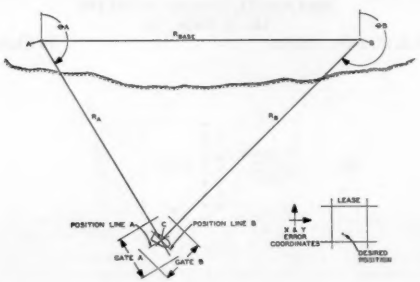


This invention relates to a method of processing Loran signals using hard-limit techniques while overcoming interference problems usually associated with hard-limit processing. RF noise is added to the input signal to maintain a signal-to-noise ratio equal to ½. This restores the output signal linearity. A closed loop implementation is employed to control the amount of noise added to the input signal whereby the desired signal-to-noise ratio is maintained.

3,816,832
RADIO RECEIVING STATION

Albert A. Elwood, P.O. Box 10592, Riviera Beach, Fla. 33404

Continuation-in-part of Ser. No. 833,638, June 16, 1969, Pat. No. 3,613,095. This application Oct. 4, 1971, Ser. No. 186,112
Int. Cl. G01s 5/14
U.S. Cl. 343—112 D 18 Claims

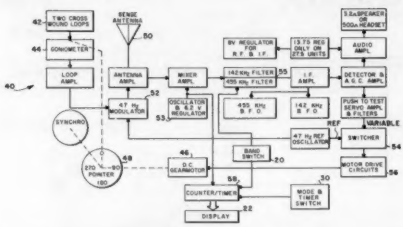


A method of and system for locating a position in which a plurality of frequency standard devices based on the action of the natural frequencies associated with transitions between energy states in atoms and/or molecules are synchronized or phase compared at the same initial location. Two of three frequency standard devices, in a two-dimensional embodiment, are placed at transmitting stations on a known baseline. The third device is at a third station, a receiving station, which receives signals from the two transmitting stations. At each transmitting station, means are provided for producing and transmitting a radio frequency carrier signal of fixed frequency and of fixed phase under the control of the frequency standard device associated with the respective station. The radio frequency carrier signals produced at the different transmitting stations differ in frequency. The radio frequency carrier signal produced at each transmitting station is modulated with a modulating signal produced under the control of the same frequency standard device which controls the means which produce the radio frequency carrier. At the receiving station, means are provided for producing a reference signal corresponding to the modulating signal and two radio frequency signals corresponding, in frequency, to the radio frequency carrier signals transmitted, the means at the receiving station being controlled by the frequency standard device associated with the receiving station. The reference signal is compared at the receiving station with the modulating signals recovered from the radio frequency carriers to determine respective time differences, the differences representing coarse position data from which the total number of phase rotations (full lanes) the receiving station is from each of the transmitting stations are determined. The phase relationships between each of the received radio frequency carrier signals and the respective one of the two radio frequency signals produced at the receiving station are determined, the relationships representing fine position data which are measurements of the receiving station position within a given phase rotation (lane). Methods and systems for locating a position in three dimensions are also described. The fine ranges, distances within given lanes, are respectively added by a computer to respective coarse ranges, each of which represents the total number of lanes to the full lane closest to respective ones of the transmitting stations, the totals being the distances between the receiving station and each of the transmitting stations.

3,816,833
AIRCRAFT ADF WITH DIGITAL FREQUENCY DISPLAY AND TIMER

Donald P. Ryan, Bloomfield, N.J., assignor to Edo-Aire, A Division of Edo Corporation, Fairfield, N.J.

Filed Sept. 15, 1971, Ser. No. 180,726
Int. Cl. G01s 3/04
U.S. Cl. 343—113 R 6 Claims



An automatic direction finder for air navigation systems has an electronic pulse counting system with a frequency mode for providing a digital display of the frequency to which the radio is tuned and a timing mode which displays minutes and seconds. The count is visually displayed by a digital display unit. The counting system includes a series of pulse counters connected through a gating circuit to a local oscillator and a timing signal generator. The gating circuit passes timing pulses or pulses representing the radio frequency to the pulse counters, depending upon a predetermined selection of a time mode or a frequency mode, respectively. Decoding devices convert the count to a signal readable by the digital display unit. Logic circuitry resets and preloads the pulse counters and gates the output of the pulse counters to the decoding devices.

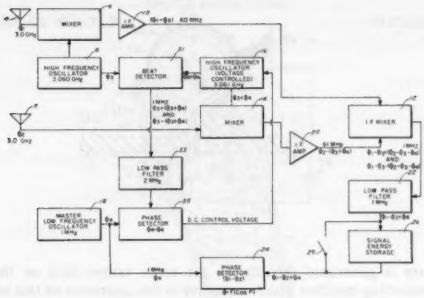
3,816,834
ELECTRONIC DIRECTION FINDER

Robert C. Wilson, Boulder, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Oct. 27, 1972, Ser. No. 301,656
Int. Cl. G01s 3/48
U.S. Cl. 343—113 R 6 Claims

A radio interferometer system for providing indication of the direction of a signal source by detection of the phase dif-

ference between signals from the common source which are received by two spaced apart antennas connected respectively to a reference channel and a measurement channel and having



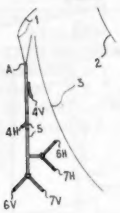
means for collapsing a broad spectrum signal for phase measurement at a low frequency by comparison to a locally generated reference signal.

3,816,835

MULTIPLEXER-DEMULTIPLEXER FOR MICROWAVE ANTENNAS

Nhu Bui Hai, and Alexandre Osias, both of Paris, France, assignors to Thomas-CSF, Paris, France

Filed May 3, 1973, Ser. No. 356,812
Claims priority, application France, May 5, 1972, 72.16104
Int. Cl. H04l *5/00*
U.S. Cl. 343—176 **4 Claims**



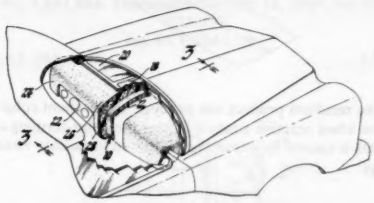
The multiplexer-demultiplexer operates in the 3.6 to 4.2, 5.9 to 6.4 and 6.4 to 7.1 kmc frequency bands. For demultiplexing, for example, the system operates as follows: Two serially arranged directional couplers respectively deliver the vertically-polarized signals of the first frequency band and the horizontally-polarized signals of the first frequency band to two outputs of the system, and the remainder of the signals received from the antenna to a polarizer. The latter feeds two waveguides with respective stubs and matching networks, forming the first branches of two Y-junctions; each one of the other branches of these Y-junctions feeds a filter. The four corresponding filters, whose outputs form other outputs of the system, respectively deliver the horizontally-polarized signals in the 6.2 to 6.4 kmc and 6.7 to 7.1 kmc frequency sub-ranges and the vertically-polarized signals in the 5.9 to 6.2 kmc and 6.4 to 6.7 kmc frequency sub-ranges.

3,816,836

SHIELDED INSTRUMENT PANEL FOR USE WITH A WINDSHIELD RADIO ANTENNA

Stanley E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 11, 1973, Ser. No. 368,538
Int. Cl. H01q *1/32*
U.S. Cl. 343—713 **5 Claims**



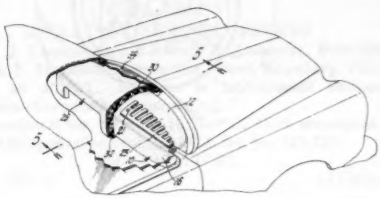
An instrument panel pad assembly located beneath the windshield opening of an automobile, including a metal shield in the form of a metal coating sprayed onto a non-conductive portion of a rigid insert within the instrument panel pad assembly and located to provide a radio frequency shield between the wiring of instrument panel and antenna of the vehicle.

3,816,837

INSTRUMENT PANEL RADIO ANTENNA

Stanley E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 11, 1973, Ser. No. 368,539
Int. Cl. H01q *1/32*
U.S. Cl. 343—713 **6 Claims**



An instrument panel assembly located beneath the windshield opening of an automobile, including a metal conductor in the form of a metal coating sprayed onto a non-conductive top portion of a rigid insert within the instrument panel assembly for collecting radio waves directly through the windshield opening from outside the vehicle to thereby provide an antenna for a radio receiver.

3,816,838

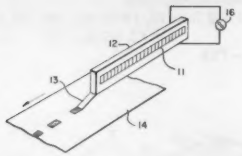
METHOD OF MAKING RECORDINGS IN A RECORDING SHEET MATERIAL

Taiji Higaki, Nishinomiya, and Masao Mikumo, Amagasaki, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Amagasaki, Hyogo, Japan

Filed Dec. 22, 1971, Ser. No. 210,885
Claims priority, application Japan, Dec. 28, 1970, 45-127821; Dec. 29, 1970, 45-126386
Int. Cl. G01d *9/00;* **B41m** *5/22*
U.S. Cl. 346—1 **5 Claims**

A method of making recordings in a recording sheet material is disclosed, wherein the base sheet is applied with a suspension containing finely divided solid particles of color-forming components which essentially comprises (a) leuco dyes and

(b) phenolic-aldehyde polymeric condensates and (c) particular types of monomeric substituted phenols the weight ratio of said components (b) and (c) in the range from 90 : 10 to 10 :



90. The resultant product can produce an excellent color-formation when reactive contact among the color-forming components is caused by imparting heat or an ultrasonic vibrating energy.

3,816,839

AUTOMATIC STYLUS EXTENDING MECHANISM

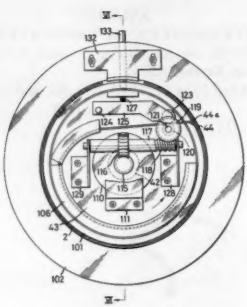
Shigemichi Honda, and Norio Ito, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 11, 1972, Ser. No. 270,708

Claims priority, application Japan, July 14, 1971, 46-52610

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 ES **12 Claims**



Method and apparatus for automatically changing the length of a recording electrode in a spark burning recorder and in which the recording electrode is mounted on a rotating recording member including detecting means for determining the length of the recording electrode and coupling means for changing the length of the recording electrode as it rotates when desired or necessary.

3,816,840

ELECTROGRAPHIC RECORDING PROCESS AND APPARATUS USING CONDUCTIVE TONER SUBJECT TO A CAPACITIVE FORCE

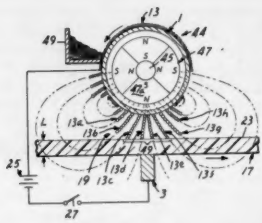
Arthur R. Kotz, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 20, 1973, Ser. No. 353,139

Int. Cl. G01d *15/06;* **G03g** *13/14*

U.S. Cl. 346—74 ES **25 Claims**

An electrographic process and device are provided wherein a dielectric recording member is arranged between two electrodes to one of which is adherably bound electronically conductive toner powder, the toner powder providing an electronically conductive path between the electrode to which it is bound and the adjacent surface of the dielectric member, and a voltage applied to the electrodes for a time and of a magnitude sufficient to generate a force pattern of intelligence on the toner which enables toner deposition on the recording member in accordance with the force pattern. The force pattern is generated directly on the toner rather than on the recording member which is passive in the operation of this invention.



3,816,841

DEVICE FOR THE AUTOMATIC STOP SETTING OF PHOTOGRAPHIC CAMERAS

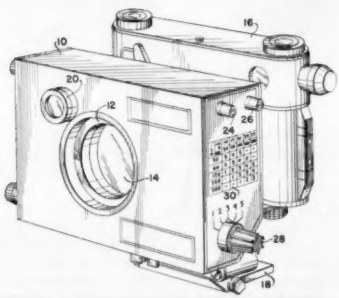
Herbert Maronde, Dusseldorf, and Hans Dietrich Schmidt, Monheim-Baumberg, both of Germany, assignors to Robot Foto und Electronic GmbH & Co. KG., Dusseldorf-Benrath, Germany

Filed Oct. 6, 1972, Ser. No. 295,729

Claims priority, application Germany, Oct. 13, 1971, 2150945

Int. Cl. G03b *7/08, 9/02*

U.S. Cl. 95—10 CD **16 Claims**

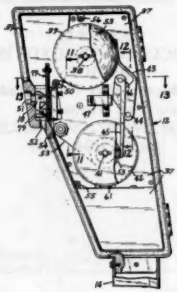


An attachment for a camera has an adjusting ring rotatable about an axis. The stop setting ring of the camera is positioned within the adjusting ring and the two are engaged so that rotation of the adjusting ring will rotate the stop setting ring. A photoelectric cell projecting forwardly on the attachment measures the ambient light and operates a servomotor to rotate the adjusting ring accordingly. A shade affixed to the adjusting ring moves into the path of the light to the photocell to a greater or less extent depending on the position of the adjusting ring. This is correlated with the light through the lens setting so that when the latter is at an optimum, the amount of light reaching the cell (past the shade) causes the cell to deenergize the servomotor.

3,816,842
CAMERA STRUCTURE

Theodore J. Glaros, Bloomington; Roland L. Hron, and George E. Pribyl, both of Minneapolis, all of Minn., assignors to Cir-Tech, Inc., Columbia Heights, Minn.

Filed Aug. 16, 1972, Ser. No. 281,202
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 R **25 Claims**

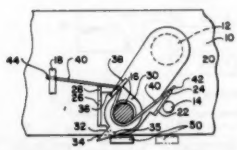


An automatic camera for simultaneously taking the picture of an individual and information with which the individual is identified. The camera is adapted to receive a roll of film on a supply reel, the film being threaded through a lens and shutter mechanism and received by a take up reel. Following actuation of the shutter mechanism to take the picture, the film is automatically advanced to a new exposure position. To insure that actuation of the shutter mechanism will always result in taking a usable picture, the camera includes means for determining when a sufficient length of new film has been wound on to the take up reel and for precluding camera operation before that time. Similarly, means are included for sensing the amount of film left on the supply reel, for generating an alarm when a predetermined amount of film remains, and for precluding camera operation when the end of the film roll is approached.

3,816,843
SHUTTER MECHANISM

Robert L. Couture, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,552
Int. Cl. G03b *9/10*
U.S. Cl. 354—250 **5 Claims**

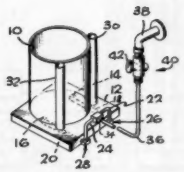


A shutter mechanism including a shutter blade, a shutter driver and a shutter spring. The shutter blade is pivotally mounted for rotation between a closed and an open position and the shutter drive is pivotally co-mounted for rotation from an initial position in a first direction to drive the shutter blade to its open position and for rotation from its initial position in a second direction to permit cocking of the shutter drive mechanism without moving the shutter blade from its closed position. The shutter spring normally urges the shutter blade toward its aperture covering position. During movement of the shutter driver in the second direction, the shutter spring maintains the shutter blade in its aperture covering position and urges the shutter driver toward its initial position.

3,816,844
FILM WASHING APPARATUS

Irving Pfefer, 6232 Atoll Ave., Van Nuys, Calif. 91401

Continuation-in-part of Ser. No. 720,757, April 12, 1968, Pat. No. 3,581,568. This application May 12, 1969, Ser. No. 823,679
Int. Cl. G03d *13/04*
U.S. Cl. 354—328 **1 Claim**

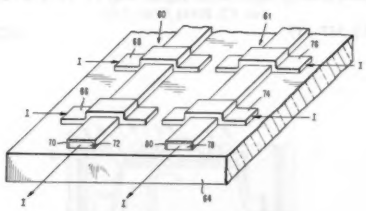


Apparatus for washing film comprising a round tank and a water pipe leading to holes in the base of the tank. The water pipe includes a portion with an opening constructed to draw in air to mix with the water, so that an air-water mixture enters the tank. The holes in the tank are near its perimeter and may be directed tangentially so that the air-water mixture swirls. The water pipe is adapted for connection to a water faucet through a thermometer-holding fixture, from which the thermometer can be readily removed.

3,816,845
SINGLE CRYSTAL TUNNEL DEVICES

Jerome J. Cuomo, Bronx; Robert B. Laibowitz, Peekskill; Ashok F. Mayadas, Somers, and Robert Rosenberg, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 875,615, Nov. 12, 1969, abandoned. This application Sept. 23, 1971, Ser. No. 183,225
Int. Cl. H01l *17/00*
U.S. Cl. 357—5 **14 Claims**



A tunneling device, or array of such devices, having at least one electrode which is a single crystal. Tunnel devices having two or more electrodes are shown, as are thin film Josephson devices having two single crystal electrodes. The electrodes of any device can be of the same or different material, and the crystallographic orientations of these electrodes can be the same or different. Although the tunnel barrier is usually an insulator, it can be other materials, or even a vacuum. In a particular embodiment, the barrier is an epitaxial layer. Both inline and crossed-stripe geometries are used.

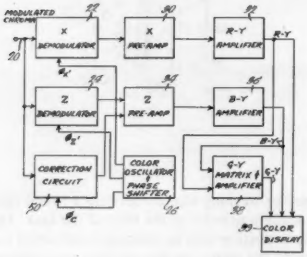
ERRATUM

For Class 357—17 see:
Patent No. 3,816,847

3,816,846
HUE CORRECTION SYSTEM

Leroy W. Nero, Fort Wayne, Ind., and Kenneth A. Merriweather, Evanston, Ill., assignors to Warwick Electronics, Inc., Chicago, Ill.

Filed Nov. 1, 1972, Ser. No. 302,849
Int. Cl. H04n 9/50
U.S. Cl. 258—28 12 Claims

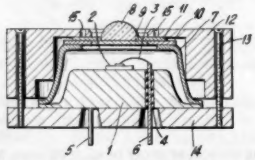


In the chroma channel of a color television receiver, a pair of color demodulators demodulate along wide angle axes of reduced included angle in the flesh tone region. A third demodulator, in response to the presence of green and cyan hues in a chroma signal, generates a proportional correction signal which is subtracted from a demodulated B-Y color difference signal to correct for errors in the green and cyan regions caused by wide angle demodulation.

3,816,847
LIGHT-SENSIBLE SEMICONDUCTOR DEVICE

Hiroyuki Nagao, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 17, 1973, Ser. No. 361,326
Claims priority, application Japan, May 19, 1972, 47-50101
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 357—17 4 Claims

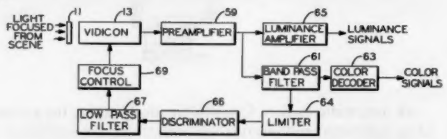


A light-sensible semiconductor device comprises a hermetic sealing case provided with a thin planar glass plate as the top surface member. A light-sensible semiconductor chip is fixed in position within the hermetic sealing case in proximity to the planar glass plate, and a light converging lens is attached onto the planar glass plate. A holder member for the light converging lens is closely attached to the hermetic sealing case in proximity to the planar glass plate, and a light converging lens is attached onto the planar glass plate. A holding member for the light converging lens is closely attached to the hermetic sealing case and holds the lowermost peripheral portion of the light converging lens, and a member presses the holder member of the light converging lens against the hermetic sealing case to secure the close attachment of the holder member for the light converging lens onto the planar glass plate.

3,816,848
AUTOMATIC FOCUS CONTROL FOR IMAGE PICKUP DEVICES

Kenneth Romayn Skinner, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 29, 1972, Ser. No. 239,038
Int. Cl. H04n 9/06
U.S. Cl. 358—47 8 Claims

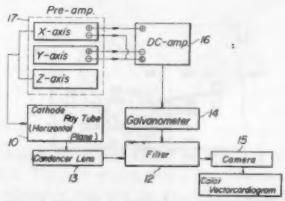


An improved one camera color television system having a feedback system for automatically controlling the electron beam focus within the camera tube is disclosed. A component of the color information output signals from the camera such as the color information carrier frequency is monitored, and a limiter-discriminator output voltage indicative of this frequency is employed to control a focusing element in the tube.

3,816,849
METHOD AND APPARATUS FOR PREPARING VECTORCARDIOGRAMS WITH COLORS IN ACCORDANCE WITH DEPTH

Shinji Kinoshita, and Tadashi Kobayashi, both of Sapporo, Japan, assignors to Hokkaido University, Sapporo City, Hokkaido, Japan

Filed Mar. 13, 1972, Ser. No. 234,199
Claims priority, application Japan, Sept. 9, 1971, 46-70124
Int. Cl. H04n 9/02
U.S. Cl. 358—81 11 Claims



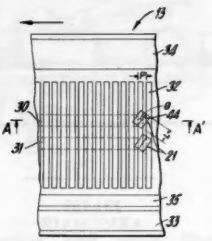
A color vectorcardiogram having spots colored with different colors in accordance with the depth thereby enabling a stereographical diagonosis is prepared by displaying a horizontal vector loop of a vectorcardiograph on the fluorescent screen of a cathode ray tube, photographing the image of the spots of the horizontal vector loop through a tomographic filter or a color filter and coloring with different colors the respective spots of the photographed vector loop in accordance with the vertical scalar of the vectorcardiograph.

3,816,850

MAGNETIC RECORDING METHOD AND APPARATUS USING A MULTI-LAYER RECORDING TECHNIQUE

Hiroaki Otsuka, Tokyo; Norihisa Manabe, Saitama, and Tatsuo Konishi, Tokyo, all of Japan, assignors to Nippon Hoso Kzokoi and Nippon Electric Company, Limited, both of Tokyo, Japan

Filed Nov. 9, 1972, Ser. No. 305,115
Claims priority, application Japan, Nov. 12, 1971, 46-90780
Int. Cl. G11b 5/02; H04n 5/78
U.S. Cl. 360—55 8 Claims



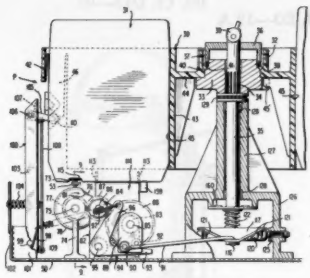
According to this multi-layer recording technique, a relatively low-frequency signal track is recorded on a magnetic tape in the direction of the tape's motion. A plurality of second relatively high-frequency tracks are recorded by one or more magnetic heads. The gap of the head or heads forms an acute angle with the second tracks such that sine component of the gap with respect to that angle is an integral multiple of the pitch of the second tracks.

3,816,851

MAGNETIC TAPE PLAYING AND CHANGING APPARATUS

Rowland Kent White, Rockville, and Simon Lloyd Lindbeck, Bowie, both of Md., assignors to Telex Communications, Inc., Minneapolis, Minn.

Division of Ser. No. 808,110, March 18, 1969, Pat. No. 3,463,962. This application Aug. 5, 1971, Ser. No. 169,484
Int. Cl. G11b 5/00
U.S. Cl. 360—92 14 Claims

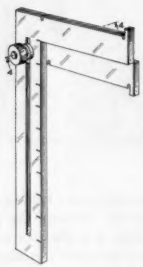


A plurality of tape cartridges are held in a rotary magazine. Mechanism is provided for indexing the magazine so as to move a particular cartridge to a play (or record) position. At the play position, the selected tape cartridge is shifted into engagement with a friction drive forming a part of the power train for indexing the magazine and shifting cartridges. A magnetic pick-up (or record) head has an independent drive enabling the head to register with each of a plurality of tape channels. The entire apparatus is characterized by simplicity, compactness and economy as well as durability.

DESIGNS

JUNE 11, 1974

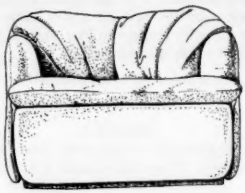
231,756
FRAME FOR MAKING FRINGE
Jeannette L. Webb, P.O. Box 287, Madison, N.J. 07940
Filed Jan. 30, 1973, Ser. No. 327,959
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D3—19 A



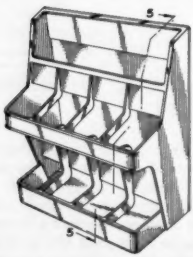
231,757
CHAIR
Siegbert Golzer, Saarbrucken, Germany, assignor to Mauser Kommanditgesellschaft, Cologne, Germany
Filed June 6, 1972, Ser. No. 260,345
Claims priority, application Germany Jan. 17, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

231,758
COUCH
Alberto Rosselli, Milan, Italy, assignor to Industria Arredamenti Fratelli Saporiti, Besnate, Varese, Italy
Filed May 28, 1971, Ser. No. 148,305
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

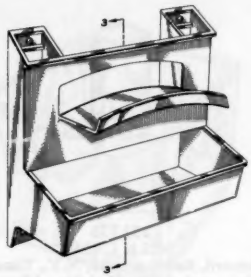
231,759
ARMCHAIR
Alberto Rosselli, Milan, Italy, assignor to Industria Arredamenti Fratelli Saporiti, Besnate, Varese, Italy
Filed May 28, 1971, Ser. No. 148,303
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



231,760
RACK FOR BAGS AND WRAPPING MATERIALS
Charles F. Molzen, Wooster, Ohio, assignor to Rubbermaid Sales Corp., Wooster, Ohio
Filed Aug. 14, 1972, Ser. No. 280,739
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—136

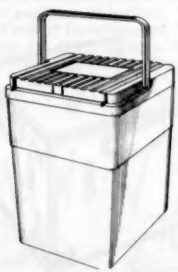


231,761
VACUUM CLEANER ACCESSORY RACK
Richard D. Dilyard, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 20, 1972, Ser. No. 300,775
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



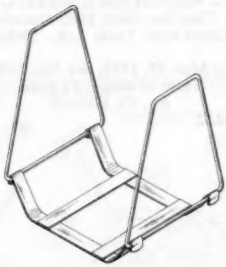
231,762
WINE GOBLET
Thomas H. Stott, Pleasant Hill, Calif., assignor to IMS Corporation, Albuquerque, N. Mex.
Filed Apr. 18, 1972, Ser. No. 245,295
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

231,763
INSULATED CHEST
David Edward Roche, Nashua, N.H., assignor to Family Products, Inc., Tyngsboro, Mass.
Filed Sept. 27, 1972, Ser. No. 292,780
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—77

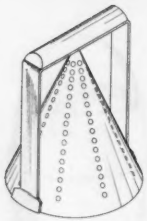


231,764
INSULATED JUG
David Edward Roche, Nashua, N.H., assignor to Family Products, Inc., Tyngsboro, Mass.
Filed Sept. 27, 1972, Ser. No. 292,779
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—77

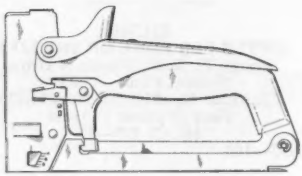
231,765
LIFTER FOR FOWL OR THE LIKE
George W. Kean, Woodland Drive, Granby, Conn. 06035
Filed June 12, 1972, Ser. No. 261,623
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—103



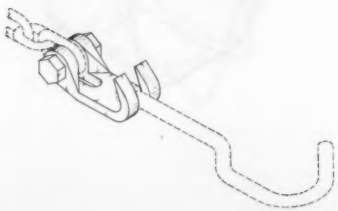
231,766
OPENER FOR A SCREW TOP TYPE BOTTLE OR THE LIKE
James Charles Kannemeyer, House 80, Gaborone, Botswana, Republic of South Africa
Filed Nov. 2, 1972, Ser. No. 303,088
Claims priority, application Republic of South Africa May 15, 1972
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—40



231,767
TACKER OR SIMILAR ARTICLE
John J. Power, Westbury, N.Y., Antoon M. Hurkmans, New Milford, Conn., and Edward E. Barrett, Massapequa Park, Long Island, N.Y., assignors to Swingline Inc., Long Island City, N.Y.
Filed Dec. 29, 1971, Ser. No. 213,369
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—49



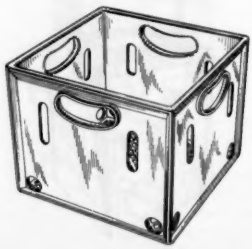
231,768
COUPLING FOR CHAIN AND FINGER HOOK
Guy Norman Chartier, West Hill, Ontario, Canada, assignor to Guy-Chart Tools Ltd., Pickering, Ontario, Canada
Filed Mar. 27, 1972, Ser. No. 238,742
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—252



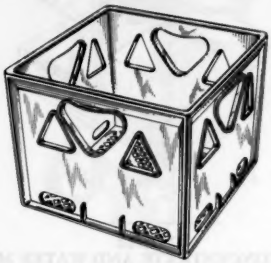
231,769
ELECTRICAL WIRE PROTECTOR
Glenn V. Searer and Vernon A. Searer, both of 3401 S. Nappanee St., Elkhart, Ind. 46514
Filed Oct. 31, 1972, Ser. No. 302,515
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—263

231,770
MILK CASE
James K. Bernard, Ballston Lake, N.Y., Timothy F. Gary, Dover, Del., and John Cholakis, Albany, N.Y., assignors to International Playtex Corporation, New York, N.Y.
Filed June 21, 1972, Ser. No. 265,086
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177

231,771
MILK CASE
Timothy F. Gary, Dover, Del., and John Cholakis, Albany, N.Y., assignors to International Playtex Corporation, New York, N.Y.
Filed June 21, 1972, Ser. No. 265,088
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



231,772
MILK CASE
Timothy F. Gary, Dover, Del., Richard C. Hunter, Wheaton, Ill., and Harvey F. Williams, New Rochelle, N.Y., assignors to International Playtex Corporation, New York, N.Y.
Filed Nov. 2, 1972, Ser. No. 303,158
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177

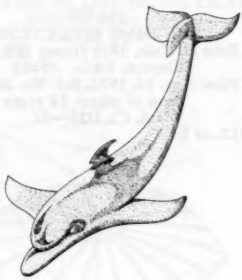


231,773
CAN OR SIMILAR ARTICLE
Carmen T. Mascia, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Continuation-in-part of abandoned design application Ser. No. 133,461, Apr. 12, 1971. This application Apr. 20, 1972, Ser. No. 246,102
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

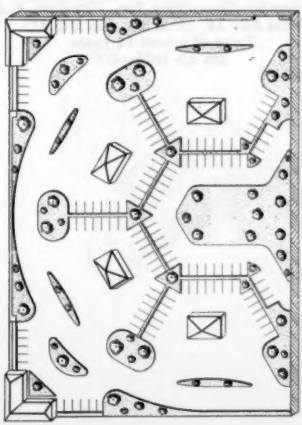
231,774
COMBINED DISPENSER AND CLOSURE CAP FOR A PRESSURIZED CAN
James Hugh McLaughlin, Ridgefield, N.J., assignor to Center for New Product Development, New York, N.Y.
Filed Jan. 10, 1973, Ser. No. 322,887
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258

231,775
TRAILER
Florence R. Montague, 3450 Fisher Road, Indianapolis, Ind. 46239
Filed Jan. 29, 1973, Ser. No. 327,325
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103

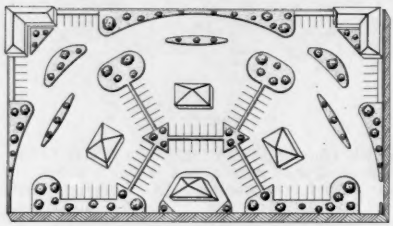
231,776
VEHICULAR SAFETY DEVICE OR THE LIKE
Kenneth D. Kramb, Portage, and Walter J. Isabell, Kalamazoo, Mich., assignors to K.I.C. Incorporated, Portage, Mich.
Filed Nov. 13, 1972, Ser. No. 305,857
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—199



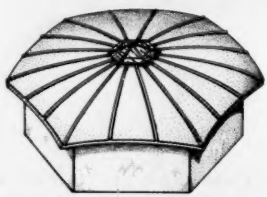
231,777
FREEWAY COMMERCIAL CENTER
Louis Koth Glasbrenner, 440 Arroyo Terrace, Pasadena, Calif. 91100
Original design application Dec. 29, 1969, Ser. No. 20,684, now Patent No. 222,440. Divided and this application Aug. 2, 1971, Ser. No. 168,532
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 R



231,778
FREEWAY COMMERCIAL CENTER
Louis Koth Glasbrenner, 440 Arroyo Terrace, Pasadena, Calif. 91100
Original design application Dec. 29, 1969, Ser. No. 20,684, now Patent No. 222,440. Divided and this application Aug. 2, 1971, Ser. No. 168,537
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 R

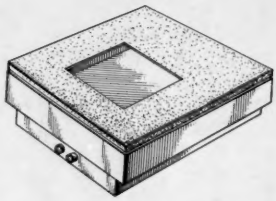


231,779
BUILDING STRUCTURE
John D. Cole, 3860 Honey Hill Lane, Dayton, Ohio 45405
Filed Aug. 14, 1972, Ser. No. 280,595
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 E

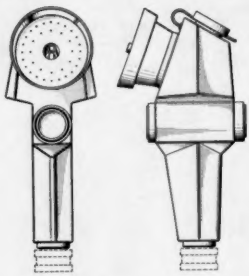


231,780
END PIECE FOR HANDRAIL
Edward C. Hallock, Summit, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.
Filed July 28, 1972, Ser. No. 276,225
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—7

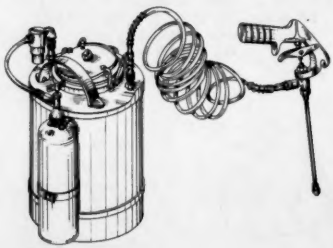
231,781
BIOLOGICAL TRAY ILLUMINATOR
Lamont J. Seitz, Huntington Beach, and Stephen G. Hauser, Tarzana, Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Feb. 2, 1972, Ser. No. 223,050
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D16—2 C



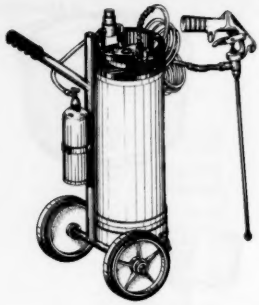
231,782
LIQUID CONCENTRATE AND WATER MIXING AND DISPENSING SPRAY GUN
Anthony Carsello, Rolling Hills, Calif., assignor to Dream Flo Systems, Inc., Torrance, Calif.
Filed Mar. 2, 1972, Ser. No. 231,448
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



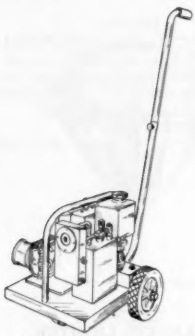
231,783
HAND CARRIED SPRAYER
John H. Morehouse, 2723 E. 1st St., and John B. Morehouse, 2704 E. 1st St., both of Mesa, Ariz. 85203
Filed Feb. 3, 1972, Ser. No. 223,391
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

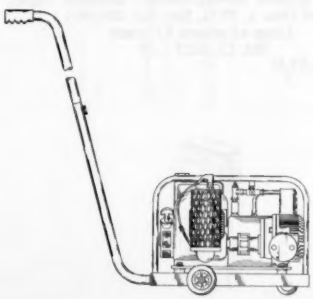


231,784
PORTABLE SPRAYER
John H. Morehouse, 2723 E. 1st St., and John B. Morehouse, 2704 E. 1st St., both of Mesa, Ariz. 85203
Filed Feb. 3, 1972, Ser. No. 223,392
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

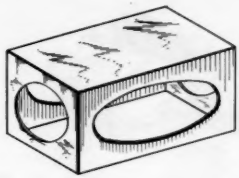


231,785
PORTABLE LIQUID CHEMICAL DISPERSING APPARATUS
John C. Thompson, Los Angeles, Calif., assignor to Micro-Gen Equipment Corporation, San Antonio, Tex.
Continuation-in-part of design application Ser. No. 244,319, Apr. 14 ,1972. This application Sept. 11, 1973, Ser. No. 396,217
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

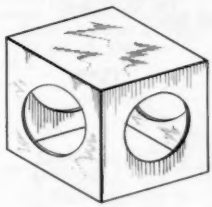




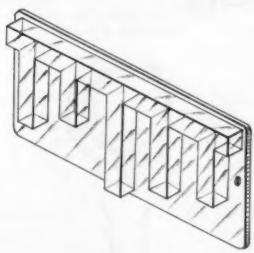
231,786
DISPLAY COVER FOR AN AQUARIUM OR SIMILAR ARTICLE
Richard N. Burnley, 116 University Place, New York, N.Y. 10003
Filed Feb. 28, 1972, Ser. No. 230,190
Term of patent 7 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



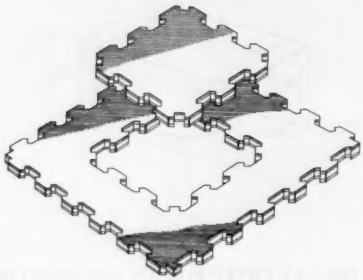
231,787
DISPLAY COVER FOR AN AQUARIUM OR SIMILAR ARTICLE
Richard N. Burnley, 116 University Place, New York, N.Y. 10003
Filed Feb. 28, 1972, Ser. No. 230,191
Term of patent 7 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



231,788
MARBLE GAME PUZZLE
John C. Peterson, 1322 S. 51st St., Omaha, Nebr. 68106
Filed Feb. 1, 1972, Ser. No. 222,719
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



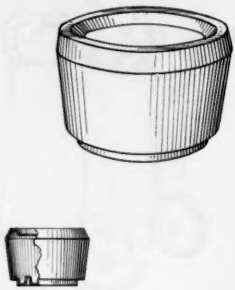
231,789
INTERLOCKING CUSHION TILE
Yukii Ozeki, Tomiokwanishi, and Yoshinori Tabata, Osaka, Japan, assignors to Voltek, Inc., Burlington, Mass., and Sekisui Chemical Company Ltd., Osaka, Japan
Filed Oct. 26, 1971, Ser. No. 192,696
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG



231,790
RIDEABLE BOUNCING TOY
Peter Ian Raphael, 38 Oakwood, Cheadle Hulme, England
Filed May 19, 1972, Ser. No. 255,321
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 DD

231,791
BABY RATTLE
Ronald J. Sidman, Boston, Mass., assignor to Kiddie Products, Inc., Squantum, Mass.
Filed Aug. 21, 1972, Ser. No. 282,378
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AG

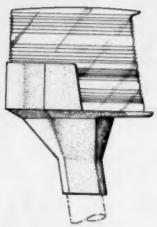
231,792
PLANTER
Robert W. Rynberk, Oak Lawn, Ill., assignor to Imperial Landscaping & Supply Co., Inc., Oak Lawn, Ill.
Filed Apr. 18, 1973, Ser. No. 352,341
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



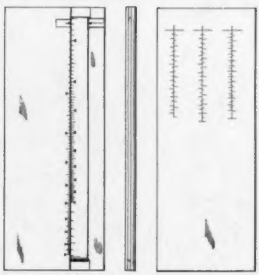
231,793
JEWELRY STONE
Gilbert Golay, Moudon, Switzerland, assignor to Tousdiamants S.A., Moudon, Vaud, Switzerland
Filed Jan. 5, 1973, Ser. No. 321,142
Claims priority, application Switzerland July 10, 1972
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1 A

231,794
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi-shi, Saitama, Japan
Filed Dec. 1, 1971, Ser. No. 203,941
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R

231,795
COMBINED BOW AND ANCHOR LAMP
Peter E. Brudy, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Feb. 2, 1973, Ser. No. 329,183
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R

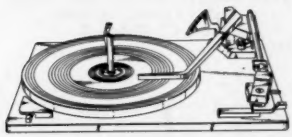


231,796
CONVERSION CALCULATOR
Walter K. Schwarz and David J. Schlink, Peoria, Ill., assignors to The Peoria Journal Star, Inc., Peoria, Ill.
Filed May 25, 1972, Ser. No. 257,061
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D64—11 R



231,797
TAMBOURINE OR SIMILAR ARTICLE
Fred A. Hoey, San Antonio, Tex., assignor to C. Bruno & Son, Inc., Melville, N.Y.
Filed July 17, 1972, Ser. No. 272,318
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

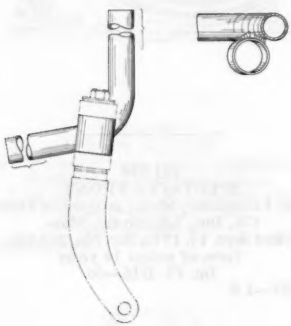
231,798
RECORD PLAYER
Hanji Takahashi, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed July 31, 1972, Ser. No. 276,609
Claims priority, application Japan Jan. 31, 1972
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



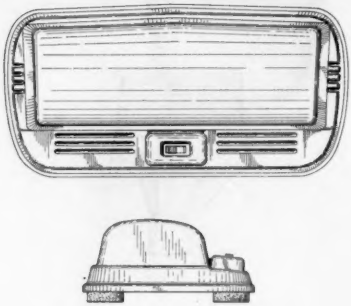
231,799
SPECTACLE FRONT
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Sept. 14, 1973, Ser. No. 399,641
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

231,800
RIBBON CARTRIDGE
Ernst Peter Hess, Castro Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 15, 1973, Ser. No. 332,940
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

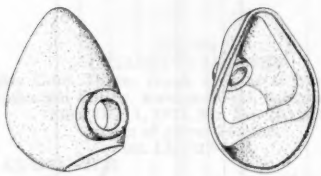
231,801
CASTER SUPPORT FOR WHEEL CHAIRS OR THE LIKE
William J. Pivacek, Elyria, Ohio, assignor to Invacare Corporation, Elyria, Ohio
Filed Dec. 11, 1972, Ser. No. 314,254
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 E



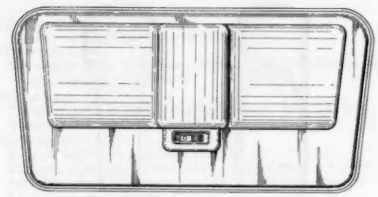
231,802
ELECTRIC FOOT MASSAGER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co.
Filed Aug. 28, 1973, Ser. No. 392,213
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D83—1 S

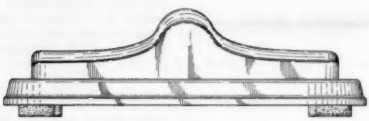


231,803
INHALATION MASK
Robert A. Huddy, 1044 Balboa Drive, Arcadia, Calif. 91006
Filed Sept. 10, 1973, Ser. No. 395,538
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D83—1 K



231,804
ELECTRIC FOOT MASSAGER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co.
Filed Sept. 27, 1973, Ser. No. 401,238
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D83—1 S

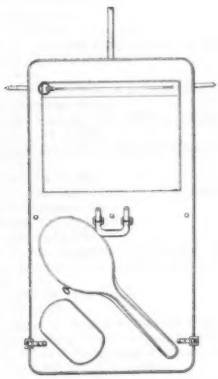




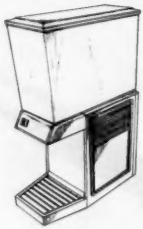
231,805
OUTDOOR PEDESTAL ASH TRAY
Conrad A. Yankee, 103 Seaview Ave., West Haven, Conn. 06516
Filed Oct. 30, 1972, Ser. No. 302,020
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—8 J

231,806
COMBINED COMB AND SHEATH THEREFOR
Hazelle J. Kirkpatrick, 3645 NW. 17th Ave., Miami, Fla. 33142
Filed Dec. 11, 1972, Ser. No. 314,236
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D86—8

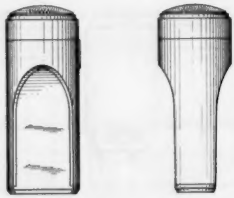
231,807
CARRYALL FOR TENNIS EQUIPMENT
Lois B. Berry, 509 W. Grant Place, Chicago, Ill. 60614, and Susan Miller, 290 Drexel Lane, Glencoe, Ill. 60022
Filed Aug. 21, 1972, Ser. No. 282,079
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



231,808
BEVERAGE DISPENSER
Gregory Fossella, Marshfield, Mass., assignor to Jet Spray Cooler, Inc., Waltham, Mass.
Filed Aug. 7, 1972, Ser. No. 278,260
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3 B



231,809
ELECTRIC SHAVER
Ichiro Fujishima, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed May 11, 1973, Ser. No. 359,295
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



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Banik, Upendra K., to American Home Products Corporation. Method for inducing menses. 3,816,617, Cl. 424-100.000.

Banyaszati Kutato Intezet: *See—*
Apostol, Tamas; Barna, Janos; Egri, Alajos; Kaplar, Zsigmond; and Majtenyi, Tibor, 3,815,835.

Banzik, Mitchell: *See—*
Sharman, Samuel H.; and Banzik, Mitchell, 3,816,353.

Bar, Hugo, to Deutsche Nemectron Gesellschaft m.b.H. Apparatus for dermatological treatment with a steam-ozone mixture. 3,815,595, Cl. 128-184.000.

Baranauckas, Charles F.: *See—*
Gelfand, Samuel; Carr, Russell L. K.; and Baranauckas, Charles F., 3,816,468.

Bard, C. R., Inc.: *See—*
Smith, David J., 3,815,164.

Bardenhagen, Dietrich, to Hauni-Werke Koerber & Co. KG. Apparatus for severing wrapped tobacco rods or the like. 3,815,460, Cl. 83-310.000.

Bardoneschi, Roland; and Muller, Georges, to Rossel Uclaf. Thiocolchicine glucoside. 3,816,396, Cl. 260-210.00r.

Barefoot, Carlton K. Method and apparatus for retreading tires. 3,816,217, Cl. 156-394.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Munnekehoff, Gerd; and Busch, Hansjochen, 3,815,836.

Barna, Janos: *See—*
Apostol, Tamas; Barna, Janos; Egri, Alajos; Kaplar, Zsigmond; and Majtenyi, Tibor, 3,815,835.

Barnebey, Herbert L. Fluid flow control valves. 3,815,630, Cl. 137-594.000.

Barnebey, Herbert Leonard, to Bernebey-Cheney Company. Washed activated charcoal absorbers. 3,815,335, Cl. 55-242.000.

Barney, Harry E., Jr.; and Engdahl, Rodney A., to FMC Corporation. Two line single pass cooker. 3,815,490, Cl. 99-365.000.

Barnish, Ian T.: *See—*
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., 3,816,516.

Barone, Bruno J.; and Cooley, Stone D., to Petro-Tex Chemical Corporation. Preparation of hydro-peroxides by autoxidation. 3,816,540, Cl. 260-610.00b.

Barrall, Edward Martin; and Lee, Kenneth, to International Business Machines Corporation. Optically inactive magneto-optic substrate. 3,816,237, Cl. 161-227.000.

Barthel, Horst, to Oil Base Germany GmbH & Co. KG. Composition and process for strengthening and sealing geological formations and strata in mining and deep drilling. 3,816,148, Cl. 106-207.000.

Bartley, John E., to Zeta International Engineering, Inc. Automatic welding apparatus. 3,815,807, Cl. 228-29.000.

Bascom, Hollis H.; Greci, John J.; and Hoopengardner, Merle R., to Orcon Corporation. Method of face seaming carpet with a hot melt adhesive carpet seaming tape. 3,816,203, Cl. 156-157.000.

Basile, Peter A., to Amerace Corporation. Installation tool for flush mounted inserts. 3,815,209, Cl. 29-240.000.

Baskas, Morris J.; and Kaufman, Harry, to Dentipressions Inc. Disposable mixing syringe. 3,815,878, Cl. 259-37.000.

Batebilt Pty. Limited: *See—*
Rhodes, David George, 3,816,821.

Batzer, Hans: *See—*
Schmid, Rolf; Lohse, Friedrich; Fisch, Willy; and Batzer, Hans, 3,816,365.

Bauer, Adolf; Weber, Karl Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, to Boehringer Ingelheim GmbH. 5-(Pyridyl or phenyl)-1H-2,3,4,5-tetrahydro-1,5-benzodiazepin-ones and salts thereof. 3,816,409, Cl. 260-239.30b.

Bauer Bros. Co., The: *See—*
Ginaven, Marvin E., 3,815,740.

Bauer, Edwin Francis; Dokken, Roger Nels; Hard, Robert Amos; and Malhota, Umesh Kumar, to Union Carbide Corporation. Process for the decarburization of molten metal. 3,816,720, Cl. 235-151.120.

Bauer, Herbert. Clock having means for periodically dispensing and controlling the release of articles. 3,815,780, Cl. 221-15.000.

Bauer, Lieselotte: *See—*
Krueger, Friedrich; Bauer, Lieselotte; and Michel, Walter, 3,816,517.

Baum, Thomas: *See—*
Bruce, William F.; and Baum, Thomas, 3,816,531.

Baumann, Arthur; and Langenegger, Werner. Weighing apparatus including pulse counter means having a relatively small capacity. 3,816,156, Cl. 177-15.000.

Baur, Eduard. Casting mold and basin-like riser therefor. 3,815,665, Cl. 164-359.000.

Bayer Aktiengesellschaft: *See—*
Bockmann, Walter; and Hornung, Rudolf, 3,816,287.
Kempermann, Theo; and Eholzer, Ulrich, 3,816,323.

Bayer, Horst O.; Hurt, William S.; and Aller, Harold E., to Rohm and Haas Company. 3-Phosphorylthio acrylamide biocidol compositions. 3,816,622, Cl. 424-211.000.

Bayer, John W., to Owens-Illinois, Inc. Epoxy base ink composition. 3,816,364, Cl. 260-18.0ep.

Bayless, Robert G.: *See—*
Brown, George T., Jr.; Clark, Donald B.; and Bayless, Robert G., 3,816,331.

Baymiller, John W., to Armstrong Cork Company. Cross-banding material for wood veneers. 3,816,236, Cl. 161-188.000.
BBC Brown Boveri & Company Limited: *See—*
Bachmann, Robert; Buxbaum, Charley; and Zigerlig, Benno, 3,816,079.
Beale, Louis C., Jr.: *See—*
Austin, Lowell W.; Beale, Louis C., Jr.; and Smith, Edwin J., 3,816,082.
Bean, Lloyd F.: *See—*
Gundlach, Robert W.; and Bean, Lloyd F., 3,816,115.
Bear Mfg. Corporation: *See—*
Robinson, Art I., 3,815,621.
Beard, Franklin; and Schwartz, Nelson E. Building roof, and the method of constructing same. 3,815,301, Cl. 52-92.000.
Beard, William L., Jr., to Whirlpool Corporation. Dryer having drum with two different diameters. 3,815,258, Cl. 34-133.000.
Beaton, Arthur L.; Schnell, Dietrich H.; and Beaton, Victor A. Automatic electro-mechanical rodent trap. 3,815,278, Cl. 43-99.000.
Beaton, Victor A.: *See—*
Beaton, Arthur L.; Schnell, Dietrich H.; and Beaton, Victor A., 3,815,278.
Beatrice Foods Co.: *See—*
Neckermann, Edwin F.; and Hammer, James A., 3,816,577.
Beaumont, Georges, to Le Materiel Medical Scientifique. Static respirator for artificial respiration. 3,815,593, Cl. 128-145.800.
Becker, Georg; and Kleindrettle, Karl, to Schwaab, W. L., Lackfabriken KG. Apparatus and process for the making and coating of hollow bodies. 3,815,535, Cl. 113-120.00a.
Becker, Julius C., to Becker Manufacturing Company, Incorporated. Floor assembly for animal enclosures. 3,815,550, Cl. 119-28.000.
Becker Manufacturing Company, Incorporated: *See—*
Becker, Julius C., 3,815,550.
Beckman Instruments, Inc.: *See—*
Ting, Philip; and Litle, Robert L., 3,816,743.
Becton, Dickenson and Company: *See—*
Rapoza, Edward J.; Siegel, Maxwell E.; Estelle, Weems E.; Petrucci, Pasquale M.; Linarducci, Joseph S.; Hamma, John; and Montgomery, John, 3,815,769.
Becton-Dickinson and Company: *See—*
Vitol, Matt J., 3,815,153.
Bednarczyk, Daniel; and Milton, Arnold T. Safety football helmet. 3,815,152, Cl. 2-9.000.
Beekman, Stewart M., to Chattem Chemicals; division of Chattem Drug & Chemical Company. Anti-perspirant aerosol composition and method of making same. 3,816,613, Cl. 424-47.000.
Beekmans, Nicolaas Marinus: *See—*
Lotgering, Frederik Karel; Beekmans, Nicolaas Marinus; Van Der Steen, Gerardus Henricus Antonius Maria; and Heigne, Leopold, 3,816,179.
Beggs, Donald; and Marston, William T., to Midrex Corporation, mesne. Method for reducing iron oxides in a gaseous reduction process. 3,816,101, Cl. 75-35.000.
Belart, Juan; and Volkmar, Werner, to ITT Industries. Master cylinder for a two-circuit brake system. 3,815,364, Cl. 60-552.000.
Belart, Juan; and David, Anton, to ITT Industries, Inc. Master cylinder for a two-circuit brake system. 3,815,961, Cl. 303-52.000.
Belden Corporation: *See—*
Giffel, Byron B.; and Cole, Robert B., 3,816,644.
Bell & Howell Company: *See—*
Duck, Sherman W.; Jeffers, Frederick J.; and Lemke, James U., 3,815,987.
Bell, Stanley C.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., 3,816,430.
Bell Telephone Laboratories, Incorporated: *See—*
Brendzel, Henry Tzvi, 3,816,734.
Giesken, Kenneth Frank, 3,816,668.
MacArthur, Donald Morley; and Skurkiss, Peter Kenny, 3,816,317.
Beloit Corporation: *See—*
Ely, Donald A., 3,815,256.
Belsky, Milan, to Vereinigte Aluminum-Werke Aktiengesellschaft. Method of processing aluminum containing ores. 3,816,605, Cl. 423-626.000.
Beltx Corporation: *See—*
DeWoskin, Irvin S.; and Jenkins, Murgatroyd H., 3,816,209.
Benckiser, Joh. A., GmbH: *See—*
Krueger, Friedrich; Bauer, Lieselotte; and Michel, Walter, 3,816,517.
Bendall, Wilfrid H. Bearings. 3,815,964, Cl. 308-78.000.
Bendix Corporation, The: *See—*
Seitz, William R., 3,815,561.
Beneteau, Joseph Oscar Charles, to Textron Inc. Apparatus for attaching fasteners to a garment in registration. 3,815,805, Cl. 227-119.000.
Benjamin, John Stanwood: *See—*
Bomford, Michael James; and Benjamin, John Stanwood, 3,816,080.
Bennett, Douglas, to Thor Power Tool Company. Muffler for a pneumatic percussion tool. 3,815,705, Cl. 181-36.00a.
Benson, Mark: *See—*
Molloy, Kenneth H.; Ward, John P.; and Benson, Mark, 3,816,796.
Bent, Richard L.: *See—*
Schellenberg, Dietmar; and Bent, Richard L., 3,816,134.
Berger, Abe. Amino-functional silicone compounds. 3,816,494, Cl. 260-448.80r.
Berger, Horst Heinz; and Wiedmann, Siegfried K., to International Business Machines Corporation. Digital logic circuit. 3,816,758, Cl. 307-214.000.
Berger, Richard F., to Dahl, Thor, Inc. Mechanism for opening envelopes. 3,815,325, Cl. 53-391.00r.
Bergeron, Charles R.: *See—*
Baker, Ralph W.; Bergeron, Charles R.; and Nugent, Adam, Jr., 3,816,608.
Bergman, Sylvester; and Pew, Richard Garth, to Dow Chemical Company, The. Polyester dyeing assisted by 2-(2,4,6-thibromophenoxy)-ethanol. 3,816,072, Cl. 8-173.000.
Bergy, Malcolm E.; Hanka, Ladislav J.; Herr, Ross R.; and Mason, DonaldJ., to Upjohn Company, The. Landakamycin and process for preparing same. 3,816,619, Cl. 424-116.000.
Bernebey-Cheney Company: *See—*
Barnebey, Herbert Leonard, 3,815,335.
Bernett, George D. Laser facsimile transceiver. 3,816,652, Cl. 178-7.600.
Berry, Robert H.; and Smith, John W. Snow mold. 3,816,048, Cl. 425-318.000.
Berry, Samuel M., to Commercial Metals Company. Spherical displacement device and seal means therefor. 3,816,038, Cl. 418-68.000.
Berry, Samuel M., to Commercial Metals Company. Rotary air pump with rotating and oscillating center piston. 3,816,039, Cl. 418-68.000.
Besant, Colin Bowden, to United Kingdom Atomic Energy Authority. Neutron spectrum standard. 3,816,742, Cl. 150-499.000.
Best, John S.; and Duda, John Larry. Well structure and method for protecting permafrost. 3,815,674, Cl. 166-57.000.
Beswick, Geoffrey Ernest; and Lindsay, Robert Joseph, to Imperial Chemical Industries Limited. Manufacture of isocyanates. 3,816,499, Cl. 260-453.00p.
Bethlehem Steel Corporation: *See—*
Link, Joseph J., Jr.; and Marsh, Gale D., 3,816,103.
Beule, Rainer: *See—*
Dziomba, Willy; Beule, Rainer; Dreyer, Gunter; and Wolf, Gerhard, 3,815,620.
Beusink, Bernard Joseph: *See—*
Beusink, Johannes Thedorus Antonius; and Beusink, Bernard Joseph, 3,815,485.
Beusink, Johannes Thedorus Antonius; and Beusink, Bernard Joseph, to Integra Lichtenvoorde N.V. Method and device for ventilating a space. 3,815,485, Cl. 98-39.000.
Bevilacqua, Frank, to Combustion Engineering, Inc. Emergency core coolant system utilizing an inactive plenum. 3,816,245, Cl. 176-61.000.
Bhattacharya, Bhairab C. Universal medium and method for extending the useful life fo semen in vitro. 3,816,249, Cl. 195-1.800.
Biais, Andre Julien Augoste Fernand: *See—*
Schouteeten, Robert Andre Gustave; and Biais, Andre Julien Augoste Fernand, 3,816,028.
Biebuyck, Lawrence F.; and Hubbard, Eugene, to American Metal Climax, Inc. Entrance structure. 3,816,011, Cl. 403-187.000.
Bierbrauer, Chester J., to Minnesota Mining and Manufacturing Company. Plural coated pile fabric. 3,816,229, Cl. 161-67.000.
Biewer, Frank N., to Offshore Technology Corporation. Self-level wind. 3,815,846, Cl. 242-158.00r.
Bigham, Jackson D., Jr.: *See—*
Ehrich, William G. E.; and Bigham, Jackson D., Jr., 3,816,645.
Bignardi, Luigi, to Snam Progetti, S.p.A. and Device for measuring the opacity of smokes. . 3,816,004, Cl. 356-207.000.
Biller, Efim; Goller, Roman; Schlegel, Richard; and Pflugk, Hellmuth, to Union Rheinische Braunkohlen Kraftstoff. Process for the production of dihydroxybenzenes. 3,816,547, Cl. 260-624.00r.
Billi, G. & C. S.p.A.: *See—*
Gariboldi, Franco, 3,815,385.
Billingsley, Robert E.: *See—*
Noll, Thomas K.; and Billingsley, Robert E., 3,816,648.
Bills, Alan J.: *See—*
Lubicz, George S.; and Bills, Alan J., 3,816,288.
Biloco, Georges; and Hooper, E. Peter J., to Forano Limitee, mesne. Grinder feeding system. 3,815,763, Cl. 214-16.00r.
Bilofsky, Ruth C.; and Cramer, Richard D., to Polaroid Corporation. Photographic processes and products employing carbazole phthaleins as optical filter agents. 3,816,119, Cl. 96-3.000.
Bilz, Otto; and Fauth, Otto, to Bilz, Otto, Werkzeugfabrik, Firma. Quick-change chuck. 3,816,015, Cl. 408-6.000.
Bilz, Otto, Werkzeugfabrik, Firma: *See—*
Bilz, Otto; and Fauth, Otto, 3,816,015.
Binks, Chester, to Restaurant Technology, Inc. Chicken cooking method. 3,816,634, Cl. 426-438.000.
Binks, Chester, to Restaurant Technology, Inc. Chicken cooking apparatus. 3,816,703, Cl. 219-440.000.
Bio-Analytical Laboratories, Inc.: *See—*
Fiore, John M., 3,815,584.
Fiore, John M., 3,815,585.
Bishop, Harry L., Jr.: *See—*
Ramachandran, Sundaresan; Fulton, James C.; and Bishop, Harry L., Jr., 3,816,100.
Bitterli, Peter; and Kehrer, Fritz, to Sandoz Ltd. Bis-(3-iminoisoindolinone)pigments. 3,816,448, Cl. 260-325.000.

Bizerba-Werke Wilhelm Kraut KG: *See*—
Schwarz, Josef, 3,815,695.

Black, Dewie E.; and Fabry, Donald F., to Burroughs Corporation. Dynamic load force calibrating system and a method for its use in a motion test system. 3,815,999, Cl. 356-138.000.

Black, Sivalls & Bryson, Inc.: *See*—
Ludwig, Gary J.; and Wood, Loren E., 3,815,779.

Black, William Brown. Jig for positioning the studs for the quarl tiles. 3,815,891, Cl. 269-45.000.

Blair, Bruce A., to International Farm Systems Inc. Structural support apparatus. 3,815,548, Cl. 119-16.000.

Blair Manufacturing Co., Inc.: *See*—
Ryan, Kelly P., 3,815,686.

Blanke, James F.; and Christopher, Charles A., Jr., to Texaco Inc. Secondary oil recovery process using beta-substituted acrylamide polymers. 3,815,679, Cl. 166-275.000.

Bliss, George N. Valve. 3,815,632, Cl. 137-625.240.

Bliss, William W. Decoding apparatus and system for an electrically encoded card. 3,816,711, Cl. 235-61.11a.

Bloch, Herman S., to Universal Oil Products Company. Hydroxylation of aromatic compounds. 3,816,545, Cl. 260-621.00g.

Blohm, Thomas R.: *See*—
Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., 3,816,457.

Blomqvist, Olle. Weight lifting exercising device. 3,815,903, Cl. 272-81.000.

Bloom, Joseph Louis: *See*—
Lewis, Geoffrey Arthur; and Bloom, Joseph Louis, 3,816,021.

Blouet, Jean: *See*—
Courcier, Francois; Blouet, Jean; Courtel, Robert; and Risler, Francis, 3,816,309.

Blower Application Company: *See*—
Panning, Martin H., 3,815,521.

Blower, Howard E.: *See*—
Evans, Ralph E.; and Blower, Howard E., 3,815,213.

Blume, William M., to Westvaco Corporation. Method and apparatus for feed-forward control of wood pulp refiners. 3,816,241, Cl. 162-198.000.

Boadle, Robert: *See*—
Daniels, Calvin L.; and Boadle, Robert, 3,816,265.

Bobo, Gerald; Hipple, James H.; and Petrosky, Edward M., to United States of America, Atomic Energy Commission. Gate valve. 3,815,868, Cl. 251-86.000.

Bobrowsky, Charles A.; and Loise, Joseph A., to Double B Construction & Incinerator Upgrading Co., Inc. Gas scrubber and method. 3,815,332, Cl. 55-223.000.

Bockmann, Walter; and Hornung, Rudolf, to Bayer Aktiengesellschaft. Photolytic process for the continuous production of benzotrichloride with a low benzal chloride content. 3,816,287, Cl. 204-163.00r.

Bocksch, Karl; and Hensel, Willi, to Mauser Kommanditgesellschaft. Rotary armchair. 3,815,956, Cl. 297-349.000.

Boehringer Ingelheim GmbH: *See*—
Bauer, Adolf; Weber, Karl Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, 3,816,409.
Eberhardt, Hans; and Reuter, Albert, 3,816,611.
Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; and Diederen, Willie, 3,816,403.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 3,816,422.

Boggs, Roger L.: *See*—
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Boiko, Valery Ivanovich: *See*—
Mikhailov, Evgeny Leonidovich; Boiko, Valery Ivanovich; Nikolaev, Peter Ivanovich; Melnikov, Innokenty Alexandrovich; Eremin, Vladimir Alexandrovich; Revazov, Vyacheslav Georgievich; Jurievich, Jury Iosifovich; and Losev, Gennady Evgenievich, 3,815,879.

Bolhofer, William A., to Merck & Co., Inc. (α-(3-Trifluoromethylphenoxy)-4-chlorobenzyl)-heterocycles. 3,816,446, Cl. 260-307.00f.

Bollyky, Laszlo Joseph, to American Cyanamid Company. Electronegatively substituted carboxyphenyl oxalates as superior chemiluminescent materials. 3,816,326, Cl. 252-188.3cl.

Bolton-Emerson, Inc.: *See*—
Gilbert, Henry S., 3,815,834.

Bomford, Michael James; and Benjamin, John Stanwood, to International Nickel Company, Inc., The. Mechanically-alloyed aluminum-aluminum oxide. 3,816,080, Cl. 29-182.500.

Bompart, Reuben N. Sign Holder. 3,815,860, Cl. 248-464.000.

Bondarev, Vitaly Petrovich; Tusunian, Georgy Varlamovich; Budenny, Genady Georgievich; Mgeladze, Nodar Vladimirovich; Anisimov, Andr Vladimirovich; Saradzhev, Georgy Mikhailovich; Shakhbudagian-Shou, Suren Emmanuilovich; and Oringolts, Leonid Vladimirovich Device for evaluating the quality of cake in intermittent filters. 3,815,745, Cl. 210-96.000.

Bonnell, William L., Company, The: *See*—
Brockway, Warren H.; and Craven, Eugene J., 3,815,216.

Book Covers, Inc.: *See*—
Carter, Leewood C.; and Mullen, Edward K., 3,815,920.

Borg Warner Corporation: *See*—
McAninch, Herbert A.; and Mieras, Spencer H., 3,815,442.
McAninch, Herbert A.; and Mieras, Spencer H., 3,815,443.

Borg-Warner (Canada) Ltd.: *See*—
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Borick, Paul M.: *See*—
Zell, Howard C.; and Borick, Paul M., 3,816,407.

Borodin, Daniel J.: *See*—
Henry, Mort W., 3,815,642.

Borom, Marcus P.; and Burke, Joseph E., to General Electric Company. Surface heating apparatus. 3,816,704, Cl. 219-462.000.

Borror, Alan L.; and Garcia, Paulina P., to Polaroid Corporation. Photographic processes and products employing 8-quinolinol phthaleins as optical filter agents. 3,816,123, Cl. 96-3.000.

Bosch, Robert, GmbH: *See*—
Wahl, Josef; Moller, Heinz; Kammerer, Heinz; and Zechnall, Richard, 3,815,560.

Bosiger, J. Warren, to Colonial Mechandising Corporation. Television test apparatus. 3,816,653, Cl. 178-7.900.

Bosley, Rex C. Brace assembly for controlling the hip position in a child. 3,815,589, Cl. 128-80.00a.

Bossard, Fredrick R.: *See*—
Scott, Ray A.; Bossard, Fredrick R.; Strang, Elmer J.; and Mikovits, John L., 3,815,653.

Botero, Oscar: *See*—
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Bourg, Ronald G.: *See*—
Chiasson, Randall J.; Bourg, Ronald G.; and Arceneaux, Tilton J., 3,815,682.

Bouvier, Daniel; and Societe S.T. Dupont. Burner heads of liquefied fuel gas lighters. 3,816,062, Cl. 431-355.000.

Bowen, John C.; and Gunther, Rush B., to Duriron Company, Inc., The. Pumping unit for constant pulseless flow. 3,816,029, Cl. 417-223.000.

Bowerman, Paul Lee, to Cyclone Seeder Company, Inc., The. Bearing protector for fluent material distributors. 3,815,825, Cl. 239-683.000.

Bowie, Raymond Alexander; and Broome, Arthur William James, to Imperial Chemical Industries Limited. Treatment of swine sysentery. 3,816,630, Cl. 424-250.000.

Bowl-O-Beauty Co.: *See*—
Smart, Ted; and Witt, Paul R., Jr., 3,816,224.

Bozer, Keith B.; and Brown, Lloyd H., to Quaker Oats Company, The. Method for curing a prepolymerized furan binder. 3,816,375, Cl. 260-67.0fa.

Bozzato, Giuliano; and Pesaro, Mario, to Givaudan Corporation. Process for the isomerisation of nopinone. 3,816,537, Cl. 260-586.00r.

Braathen, Finn N.; and Sirovatka, George J., to Union Special Machine Company. Control system for press with sliding bolster plate. 3,815,456, Cl. 83-68.000.

Bradley, Earl H., to General Signal Corporation. Waste disintegrator. 3,815,827, Cl. 241-46.00r.

Bradley, John S. Gravimeters. 3,815,418, Cl. 73-382.000.

Bradt, David M.: *See*—
Gugliotta, George; and Bradt, David M., 3,816,746.

Brainard, Robert E. Golf shot measuring apparatus. 3,815,922, Cl. 273-184.00b.

Brandi, Bebriella: *See*—
Lugli, Gabriele; and Brandi, Bebriella, 3,816,372.

Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Lamm, Bo Robert, to Aktiebolaget Hassle. Crystalline hydrogensulfates of quaternary ammonium compounds and their use. 3,816,533, Cl. 260-567.60m.

Brasfield, Steven H.: *See*—
Searight, Charles E.; Ryan, John R.; and Brasfield, Steven H., 3,816,107.

Brauling, Herman: *See*—
Muller, Frank; Lohringer, Werner; Milles, Karl; Brauling, Herman; and Prigge, Helmut, 3,816,532.

Braun AG: *See*—
Hasselbach, Wolfgang, 3,815,924.

Braun Aktiengesellschaft: *See*—
Roth, Johann, 3,815,980.

Braun, Ralph A. Electrical discharge machine adapter. 3,816,693, Cl. 219-69.00e.

Bray, Murel B., to Vacuum thread trimmer. .. 3,815,533, Cl. 112-252.000.

Brazer, Geoffrey R.: *See*—
Curran, Patrick M.; Brazer, Geoffrey R.; and Erickson, John S., 3,815,661.

Breckenfelder, Ernst G. Method of securing together a stack of roofing shingles. 3,815,212, Cl. 29-432.100.

Breitigam, Walter V.; and Low, Hans, to Shell Oil Company. Bis (haloalkyl) pyrophosphonic acid amine salts. 3,816,519, Cl. 260-502.210..

Brendel, Gottfried J., to Ethyl Corporation. Method of preparing a beryllium hydride containing composite. 3,816,193, Cl. 149-109.000.

Brendzel, Henry Tzvi, to Bell Telephone Laboratories, Incorporated. Apparatus and method for 2's complement subtraction. 3,816,734, Cl. 235-168.000.

Brennan, John M., to Rohr Industries, Inc. Thrust reversing apparatus. 3,815,357, Cl. 60-226.00a.

Bresnick, Herbert L., to Xerox Corporation. Automatic bias control. 3,816,756, Cl. 307-149.000.

Brett, Thomas J., Jr.: *See*—
Cantor, Stephen E.; and Brett, Thomas J., Jr., 3,816,425.

Brezette, Michael Warren: *See*—
Klygis, Mindaugas Julius; and Brezette, Michael Warren, 3,815,732.

Bridwell, John W.; and Casey, Robert, to Caterpillar Tractor Co. Steering clutch and brake control system. 3,815,697, Cl. 180-6.200.

Brightman, Barrie, to Strombert-Carlson Corporation. Solid state camera tube embodying a fixed iris. 3,816,654, Cl. 178-7.200.

Briles, Franklin S. Method of connecting a rivet to work structure. 3,815,220, Cl. 29-509.000.

Brindell, Gordon D.; and Macander, Rudy (Rudolph) F., to Quaker Oats Company, The. Novel 4,4'-methylenebis (2,6-diaralkylphenols). 3,816,544, Cl. 260-619.00a.

Brining, Douglas E.: *See—*
Lupo, Fritz J.; and Brining, Douglas E., 3,815,731.

Brisard, Gerard, 1/2 to Etablissements Muller & Cie. Vehicle suspension checking apparatus. 3,815,404, Cl. 73-11.000.

British Aircraft Corporation Limited: *See—*
Meston, Spencer Davidson, 3,815,849.

British Petroleum Company, Limited, The: *See—*
Allum, Keith George, 3,816,555.
Hondermark, Jean Claude, 3,815,331.

British Petroleum Company, The: *See—*
Moran, Francis; and Myers, Philip Albert, 3,816,252.

Brockman, John P.: *See—*
Adams, Kenneth D.; and Brockman, John P., 3,815,529.

Brockway, Warren H.; and Craven, Eugene J., to Bonnell, William L., Company, The. Method of manufacturing a thermal break construction element. 3,815,216, Cl. 29-460.000.

Broderick, Frank W., to Johnson & Johnson. Method and apparatus for embossing tubular items having an open end. 3,815,493, Cl. 101-6.000.

Bromley, Keith, to United States of America, Navy. Multi-channel optical correlator system. 3,816,735, Cl. 235-181.000.

Brooks, Joseph F.; and Meyer, Robert B., to National Union Electric Corporation. Cleaning nozzle attachment for a suction cleaner. 3,815,170, Cl. 15-359.000.

Brooks,Arthur Alan, to Delamere & Williams Company Limited. Method and apparatus for loading tea bags into carton. 3,815,316, Cl. 53-24.000.

Broome, Arthur William James: *See—*
Bowie, Raymond Alexander; and Broome, Arthur William James, 3,816,630.

Brough, Richard W., to Conversion Chemical Corporation. Composition and method for producing brown coating on brass. 3,816,186, Cl. 148-6.240.

Broverman, Irwin: *See—*
Smith, Richard Dale; and Broverman, Irwin, 3,816,187.

Brower, Frank M.; Daniels, Arthur L.; and Fujioka, George S., to Dow Chemical Company, The. Process for preparing lithium aluminum hydride-aluminum hydride complexes. 3,816,192, Cl. 149-109.000.

Brown & Root, Inc.: *See—*
Koehler, Albert M., 3,815,371.

Brown, Boveri & Company Limited: *See—*
Jampen, Ulrich; and Zaba, Tadeusz, 3,816,751.
Stracke, Wilfried, 3,816,244.

Brown, George T., Jr.; Clark, Donald B.; and Bayless, Robert G., to National Cash Register Company, The. Continuous encapsulation and device therefor. 3,816,331, Cl. 252-316.000.

Brown, Lloyd H.: *See—*
Bozer, Keith B.; and Brown, Lloyd H., 3,816,375.

Brown, Newton W. Snow grader. 3,815,688, Cl. 172-789.000.

Brown, Richard L., to Midway Manufacturing Company. Tiltable table apparatus for ball rolling games. 3,815,917, Cl. 273-110.000.

Brown, Roland Clough. Combination of a wrist watch and a cigarette lighter. 3,816,056, Cl. 413-253.000.

Brown, Ted R. Heat exchange process and apparatus. 3,815,667, Cl. 165-2.000.

Brown, William L., Jr.; Hoffman, John L.; and Schaefer, Maurice E., to Caterpillar Tractor Co. Engine thermodyanmic cycle analyser. 3,815,410, Cl. 73-115.000.

Brownscombe, Philip J., to Dietzgen Corporation. Microfiche reader with floating lens. 3,815,975, Cl. 350-255.000.

Broxterman, David F.: *See—*
Sirocka, Richard L.; and Broxterman, David F., 3,815,354.

Bruce, George H.; and Ilfrey, William T., to Esso Production Research Company. Method and apparatus for controlling hydrostatic pressure gradient in offshore drilling operations. 3,815,673, Cl. 166-.500.

Bruce, William F.; and Baum, Thomas, to American Home Products Corporation. (2,6-Disubstituted benzylidene) amino guanidines and related compounds. 3,816,531, Cl. 260-564.00f.

Brudnak, Andrew, Jr.: *See—*
Carlson, Ernest C.; Brudnak, Andrew, Jr.; and Yeh, Rudolph E., 3,815,766.

Bruen, Charles Patrick; Low, William Wayne; and Smalley, Edmund Walter, to Allied Chemical Corporation. Method for recovering chromium values from chromite ore. 3,816,095, Cl. 75-3.000.

Bruner, James D.: *See—*
Richter, Albert P., Jr.; Bruner, James D.; Mazzagarri, Roy P.; and Hall, Hugh E., Jr., 3,815,691.

Brunnmueller, Friedrich; Schatz, Hermann; Mayer, Johann; and Grabowsky, Otto, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Continuous manufacture of amino resin solutions. 3,816,376, Cl. 260-69.00r.

Brunswick Corporation: *See—*
Anderson, Ronald R., 3,815,559.
Duvall, Paul F.; Humphrey, W. Donald; Timberlake, Thomas E.; and Foral, Ralph F., 3,815,773.
Russell, Jack A.; Walker, Jerome F.; and Hardenbrook, James M., 3,815,909.

Bryan, Graham W.: *See—*
Green, David T.; and Bryan, Graham W., 3,815,476.

Bryant, Cameron C. Apparatus for the automatic regulation of the flow of fluid. 3,815,626, Cl. 137-432.000.

Bucalo, Louis, to Investors In Ventures, Inc. Bacterial seals. 3,815,577, Cl. 128-1.00r.

Bucalo, Louis, to Investors In Ventures, Inc. Method of inserting emplant into a portion of a tubular organ whose mucous lining has been partially removed. 3,815,578, Cl. 128-1.00r.

Buckbee-Mears Company: *See—*
Crask, Roy I.; and Egerer, William D., 3,816,802.

Buckethal, Paul J., to Globe-Union Inc. Storage battery and case therefor. 3,816,181, Cl. 136-166.000.

Buckley, Michael J. PPG Industries, Inc. Glass-ceramic decoration. 3,816,161, Cl. 117-37.00r.

Budd, Garland D.; Colombo, Gregory R.; and Waldo, Russell W., to Ideal Security Hardware Corporation. Slide actuator for toggle switch. 3,816,686, Cl. 200-330.000.

Budenny, Genady Georgievich: *See—*
Bondarev, Vitaly Petrovich; Tusunian, Georgy Varlamovich; Budenny, Genady Georgievich; Mgeladze, Nodar Vladimirovich; Anisimov, Andr Vladimirovich; Saradzhev, Georgy Mikhailovich; Shakhbudagian-Shou, Suren Emmanuilovich; and Oringolts, Leonid Vladimirovich 3,815,745.

Buehler Corporation, The, mesne: *See—*
Faust, Elbert R., 3,815,617.

Bui Hai, Nhu; and Osias, Alexandre, to Thomson-CSF. Multiplexer-demultiplexer for microwave antennas. 3,816,835, Cl. 343-176.000.

Bullard, Russell H.; Lloyd, Robert M.; and Zipser, David B., to Singer Company, The. Split fin heat exchange unit. 3,815,672, Cl. 165-151.000.

Bultemann, Hans-Joachim. Device for separating mixtures of gaseous and/or vaporous substances, especially for separation of a carrier gas in devices for gaschromatography. 3,815,340, Cl. 55-392.000.

Bunker Ramo Corporation: *See—*
Frey, LaVerne L., 3,816,778.

Bunnell, Arthur K., to O'Keefe, Carling, Limited. Packaging structure. 3,815,808, Cl. 229-15.000.

Burba, Christian; and Griebsch, Eugen, to Schering AG. Method for preparing polyesters by the polymerization of epsilon caprolactones. 3,816,511, Cl. 260-484.00a.

Burden, William A. M.: *See—*
Winfield, Armand Gordon, 3,816,234.

Bures, Ladislav: *See—*
Nemec, Jiri; Bures, Ladislav; and Rajnoha, Jaroslav, 3,815,347.

Burge, Harland L.; and Rodewald, Newell C., to Heckert, Bruce J. TRW Inc. Foam cooling and acoustic damping of exhaust gases produced by an internal combustion engine. 3,815,356, Cl. 60-204.000.

Burgess, Jack Ashley, to Stevens, J. P., & Co., Inc. Atomizer interrupter. 3,815,814, Cl. 236-44.00r.

Burhoe, Winslow N., to Epicure Products, Inc. Speaker enclosure. 3,815,707, Cl. 181-31.00b.

Burke, Joseph E.: *See—*
Borom, Marcus P.; and Burke, Joseph E., 3,816,704.

Burke, Oliver W., Jr., to Esso Research and Engineering Company. Aqueous latices of high polymer compositions and means for producing same. 3,815,655, Cl. 159-165.000.

Burlington Industries, Inc.: *See—*
Rivlin, Joseph, 3,816,068.

Burnham, William L.; and Thomson, Kenneth W., to Eastman Kodak Company. Automatic rewind mechanism for motion picture projector. 3,815,983, Cl. 351-124.000.

Burroughs Corporation: *See—*
Black, Dewie E.; and Fabry, Donald F., 3,815,999.
Wallace, Harry L., 3,815,497.

Busch, Hansjochen: *See—*
Munnekehoff, Gerd; and Busch, Hansjochen, 3,815,836.

Buschmann, Hans-Theo: *See—*
Eggers, Joachim; and Buschmann, Hans-Theo, 3,816,130.

Bush, Ray E., to General Motors Corporation. Transmission control indicator mechanism. 3,815,543, Cl. 116-124.00r.

Butters, John Neil; and Leendertz, Jack Albert, to National Research Development Corporation. Optical insepction. 3,816,649, Cl. 178-6.800.

Buxbaum, Charley: *See—*
Bachmann, Robert; Buxbaum, Charley; and Zigerlig, Benno, 3,816,079.

Byrd, Wendell M., Jr.: *See—*
Anderson, James J.; Byrd, Wendell M., Jr.; and Camacho, Vasco G., 3,816,143.

Byrne, John F., to Xerox Corporation. Electrophotographic element containing phthalocyanine. 3,816,118, Cl. 96-1.500.

Cade, Phillip J., to Electronics Corporation of America. Combustion supervision system. 3,816,053, Cl. 431-78.000.

Cain, Audley L.: *See—*
Lemberg, Seymour; and Cain, Audley L., 3,816,534.

Cain, Diana K.; and Morgason, Linda L. Educational board game apparatus. 3,815,919, Cl. 273-134.0ad.

Cal-Tex Semiconductor, Inc.: *See—*
Sirocka, Richard L.; and Broxterman, David F., 3,815,354.

Camacho, Vasco G.: *See—*

Anderson, James J.; Byrd, Wendell M., Jr.; and Camacho, Vasco G., 3,816,143.

Cameron-McIndoo Limited: *See—*
Monahan, William Harold, 3,815,800.

Campagna, Edward R., to Dart Industries Inc. Thermoplastic shielded glass bottle with highly roughened surface. 3,815,865, Cl. 215-1.00c.

Campbell, James D.: *See—*
Maurey, Joseph E.; and Campbell, James D., 3,815,432.

Canada-Cities Service, Ltd.: *See—*
Schutte, Robert, 3,816,305.

Canadian Patents and Development Limited: *See—*
Lambert, Alfred F., 3,815,708.

Candor, James T.: *See—*
Candor, Robert R.; and Candor, James T., 3,816,070.

Candor, Robert R.; and Candor, James T. Method and apparatus for treating porous material with fluid. 3,816,070, Cl. 8-158.000.

Canon Kabushiki Kaisha: *See—*
Kundo, Hideyo; Masaki, Tatsuo; and Kitajima, Nobuo, 3,816,116.
Momiyama, Kikuo, 3,815,974.

Cantop Incorporated: *See—*
Clark, James Elton, 3,815,791.

Cantor, Stephen E.; and Brett, Thomas J., Jr., to Uniroyal Inc. Polyol N,N'',N''-tris(2-hydroxy-3-(beta-cyanoethoxy) propyl)-N'-aminoethylpiperazine. 3,816,425, Cl. 260-268.0cn.

Carborundum Company, The: *See—*
Economy, James; Cottis, Steve G.; and Nowak, Bernard E., 3,816,417.
Wallis, Craig; and Melnick, Joseph L., 3,816,304.

Cardwell, Gilbert I., Jr., to Hughes Aircraft Company. Bilateral power conditioner for spacecraft. 3,816,804, Cl. 320-9.000.

Carlin, William W., to PPG Industries, Inc. Opening of molybdenite ores. 3,816,588, Cl. 423-49.000.

Carlisle, Richard S. Plastic-film containers with self-sealing orifices. 3,815,794, Cl. 222-491.000.

Carlson, Elmer A., to International Telephone and Telegraph Corporation. Comfort control system and components thereof. 3,815,668, Cl. 165-26.000.

Carlson, Ernest C.; Brudnak, Andrew, Jr.; and Yeh, Rudolph E., to International Harvester Company. Backhoe swing mechanism. 3,815,766, Cl. 214-138.00r.

Carlson, Glen R., to Celotex Corporation, The. Hollow poppet valve. 3,815,871, Cl. 251-310.000.

Carlton Company: *See—*
Mortensen, Peter Eli, 3,815,729.

Carpigiani, Poerio C. Continuous machines for the instantaneous production of whipped cream. 3,815,789, Cl. 222-190.000.

Carr, Keith E.; and Johnson, Robert E., to Whirlpool Corporation. Vacuum cleaner nozzle. 3,815,171, Cl. 15-369.000.

Carr, Russell L. K.: *See—*
Gelfand, Samuel; Carr, Russell L. K.; and Baranauckas, Charles F., 3,816,468.

Carrell, Herbert Daniel; and Nyssen, Adrianus Marinus, said Carrell assor. to said Nyssen, Adrianus Marinus. Cut-off apparatus for pipe machine. 3,815,455, Cl. 82-53.100.

Carreras, Edmond J.; and Custis, Irving H., to United States of America, Navy. Protective container comprising heat scalable laminate. 3,816,230, Cl. 161-89.000.

Carrier Corporation: *See—*
Hollencamp, Eugene A., 3,815,397.

Carrilo, Peter F.: *See—*
Montoya, Margarito F.; and Carrilo, Peter F., 3,815,721.

Carroll, Harvey F., to Woodmont Industries, Inc. Shaving cartridges. 3,815,233, Cl. 30-346.580.

Carrow, Guy E., to Phillips Petroleum Company. Means for flow control of thermoplastic material. 3,815,637, Cl. 138-45.000.

Carter, Leewood C.; and Mullen, Edward K., to Book Covers, Inc. Puzzle and book structure. 3,815,920, Cl. 273-157.00r.

Cartmell, James V.: *See—*
Churchill, Donald; and Cartmell, James V., 3,816,786.

Casey, Robert: *See—*
Bridwell, John W.; and Casey, Robert, 3,815,697.

Cassens, Nicholas, Jr., to Kaiser Aluminum & Chemical Corporation. Refractory ramming Mix. 3,816,146, Cl. 106-58.000.

Castellano, Joseph Anthony: *See—*
McCaffrey, Michael Thomas; and Castellano, Joseph Anthony, 3,816,336.

Caswell-Runyan Company, Inc.: *See—*
Piepenbrink, Maurice V., 3,815,441.

Cataphote Corporation: *See—*
Searight, Charles E.; Ryan, John R.; and Brasfield, Steven H., 3,816,107.

Caterpillar Tractor Co.: *See—*
Bridwell, John W.; and Casey, Robert, 3,815,697.
Brown, William L., Jr.; Hoffman, John L.; and Schaefer, Maurice E., 3,815,410.
Gorrell, James M.; and Winzeler, James E., 3,815,445.
Moser, Raymond L.; and Stedman, Robert N., 3,815,765.

Caterpillar Tractor Company: *See—*
Stedman, Robert N.; and Boggs, Roger L., 3,815,962.
Ward, Harold L., 3,815,746.

Caterpiller Tractor Co.: *See—*
Axelsson, Evald Gustav; and Collier, David, 3,815,478.

Cato, Carl P., to Dacam Corporation. Tray forming machine. 3,815,483, Cl. 93-49.00r.

Catug Corporation: *See—*
Stevens, John N., 3,815,539.

Cawley, Leo P.; Gurske, William A.; and Goodwin, William L. Mold forming device. 3,816,045, Cl. 425-175.000.

Cayol, Andre; Chenal, Jean-Claude; Clottes, Georges; Schaller, Karl; Skok, Jean; and Venobre, Henri, to Commissariat a l'Energy Atomique. Nuclear fuel assembly, especially for a fast reactor. 3,816,247, Cl. 176-78.000.

Cayol, Andre; and Ratier, Jean-Louis, to Clottes, Georges and Commissariat a l'Energie Atomique. Nuclear fuel pin. 3,816,248, Cl. 176-81.000.

Ceauselu, Constantin Octavian: *See—*
Teodorescu, Constantin Gh.; Ceauselu, Constantin Octavian; and Ioanitescu, Sorin, 3,815,487.

Celada, Juan; Mackay, Patrick W.; and Martinez, Enrique R., to Fierro Esponja, S.A. Method and apparatus for reducing particulate metal ores to sponge metal and cooling the reduced metal. 3,816,102, Cl. 75-35.000.

Celanese Corporation: *See—*
Juelke, Charles V.; and Cook, Norman K. (said Juelke assor. to), 3,816,520.
Prince, ARthur E., Jr., 3,816,581.
Prinz, Roy J., 3,816,549.
Sanborn, James E.; Lemmons, William R.; and Ramey, James M., 3,816,539.

Celotex Corporation, The: *See—*
Carlson, Glen R., 3,815,871.

Ceremsak, Richard J.; and Hersey, Avon H., to General Electric Company. Abrading mixture. 3,816,086, Cl. 51-308.000.

Ceskoslovenska akademie ved: *See—*
Mackrle, Svatopluk; and Mackrle, Vladimir, 3,815,750.

Challenge-Cook Bros., Incorporated: *See—*
Freze, Benjamin H., 3,815,257.

Champion International Corporation: *See—*
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,816,169.

Chang, Milton M. T.; and McCrickerd, John T., to Northrop Corporation. Optical correlation of scanned real-time signals. 3,816,647, Cl. 178-6.800.

Chapman, Branch W., 30% to Lee, Raymond, Organization, Inc., The. Ring and disc toss boards having interfitting halves. 3,815,915, Cl. 273-104.000.

Chapman, John Austin Charles: *See—*
Enslin, Nicholas Charl de Villiers; and Chapman, John Austin Charles, 3,816,808.

Chari, Srinivasan V., to Control Data Corporation. External magnetic field compensator. 3,816,776, Cl. 310-13.000.

Charkoudian, John C., to Polaroid Corporation. Novel photographic products and processes. 3,816,126, Cl. 96-3.000.

Charron, Jean-Claude; and Sagnard, Francois, to Duval, Saunier. Hot water heating system. 3,815,813, Cl. 236-23.000.

Chattem Chemicals; division of Chattem Drug & Chemical Company: *See—*
Beekman, Stewart M., 3,816,613.

Chay, Dong M., to Du Pont de Nemours, E. I., and Company. Low-fuming galvanizing fluxes. 3,816,188, Cl. 148-26.000.

Chemetron Corporation: *See—*
Van Horn, Charles A., 3,815,883.

Chemical Construction Corporation: *See—*
Cook, Lucien H., 3,816,528.

Chemische Werke Huls, A.G.: *See—*
Streck, Roland; and Weber, Heinrich, 3,816,382.

Chemische Werke Huls Aktiengesellschaft: *See—*
Nordsiek, Karl-Heinz; and Streck, Poland, 3,816,358.
Streck, Roland; and Weber, Heinrich, 3,816,384.

Chen, Richard J., to Polaroid Corporation. Photographic film unit. 3,816,128, Cl. 96-76.00c.

Chen, Tien C.; and Ho, Irving T., to International Business Machines Corporation. Modulo 9 residue generating and checking circuit. 3,816,728, Cl. 235-153.0bd.

Chenal, Jean-Claude: *See—*
Cayol, Andre; Chenal, Jean-Claude; Clottes, Georges; Schaller, Karl; Skok, Jean; and Venobre, Henri, 3,816,247.

Chester, John E., to Weck, Edward, & Company, Inc. Tissue gripping surgical forceps. 3,815,607, Cl. 128-354.000.

Chester, John E., to Weck, Edward, & Company, Inc. Tissue gripping surgical forceps. 3,815,609, Cl. 128-354.000.

Chevron Research Company: *See—*
Sharman, Samuel H.; and Banzik, Mitchell, 3,816,353.

Chiang, Ching: *See—*
Monte, Alexander A.; and Chiang, Ching, 3,816,262.

Chiasson, Randall J.; Bourg, Ronald G.; and Arceneaux, Tilton J. Fire smothering and oil catching apparatus for use with offshore oil rigs. 3,815,682, Cl. 169-49.000.

Chiba, Seibi: *See—*
Sakoe, Hiroaki; and Chiba, Seibi, 3,816,722.

Chibata, Ichiro; Tosa, Tetsuya; Sato, Tadashi; and Mori, Takao, to Tanabe Seiyaku Co., Ltd. Optical resolution of racemic amino acids. 3,816,254, Cl. 195-29.000.

Chicago Bridge & Iron Company: *See—*
Strunc, Robert Winfield; and Young, Wray Bertram, 3,815,775.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Schawartz, Jozsef; Szuts, Tamas; and Szentmiklosi, Peter, 3,816,411.

Choiniere, Alcide: *See—*

Keener, Gary F.; Choiniere, Alcide; and Richitelli, Charles G., 3,815,596.
Chow, Sen-Te, to United States of America, Army. Fast response automatic brightness control circuit for second generation image intensifier tube. 3,816,744, Cl. 150-213.0vt.
Chretien, Gilbert; Cirard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, to Rhone-Progil. Polymerizable compositions and method of forming products thereof. 3,816,560, Cl. 260-861.000.
Christensen, Franklin. Adjustable trigger bit. 3,815,326, Cl. 54-8.000.
Christiansen, Hans: *See—*
Haoya, Einar; Presthus, Martin; and Christiansen, Hans, 3,815,643.
Christopher, Charles A., Jr.: *See—*
Blanke, James F.; and Christopher, Charles A., Jr., 3,815,679.
Christophersen, Clarence E.: *See—*
Armstrong, Currie; and Christophersen, Clarence E., 3,815,781.
Christopherson, Diane: *See—*
Christopherson, Levon, 3,815,526.
Christopherson, Levon, to Christopherson, Diane. Tool for depositing rodent poison underground. 3,815,526, Cl. 111-7.200.
Chruch, John Armistead, to American Can Company. Method of preparing an acrylate-polymer-modified cellulose fiber. 3,816,357, Cl. 260-2.20r.
Chuang, Vincent T., to Union Carbide Corporation. Inhibition of acrylate polymerization. 3,816,267, Cl. 203-8.000.
Chupp, John P., to Monsanto Company. O-phenyl s-aryl alkylphosphonodithioates. 3,816,569, Cl. 260-961.000.
Churan, Roy G., to Vulcan Plastics Inc. Reusable plastic closure with ring seal. 3,815,777, Cl. 220-46.00r.
Churchill, Donald; and Cartmell, James V., to National Cash Register Company, The. Display device comprising a profusion of naked droplets of cholesteric liquid crystal in a substantially continuous polymeric matrix. 3,816,786, Cl. 313-400.000.
Ciba-Geigy AG: *See—*
Junod, Pierre, 3,816,601.
Schibler, Luzius, 3,816,487.
Schmid, Rolf; Lohse, Friedrich; Fisch, Willy; and Batzer, Hans, 3,816,365.
Ciba-Geigy A.G., mesne: *See—*
Mueller, Karl, 3,816,442.
Ciba-Geigy Corporation: *See—*
Dellian, Kurt A.; and Furia, Thomas A., 3,816,071.
Finch, Neville, 3,816,429.
Kirchmayr, Rudolf, 3,816,413.
Cincinnati Time Recorder Company, Inc.: *See—*
Kleinmeyer, Vernon T.; and Schinner, Thomas J., 3,816,707.
Cincinnati Time Recorder Company, The: *See—*
Singer, Paul A., 3,815,718.
Cinque, Alphonse P., to Opaque Systems, Ltd. Television enlarging and display apparatus for graphic copy. 3,816,646, Cl. 178-6.000.
Cir-Tech, Inc.: *See—*
Glaros, Theodore J.; Hron, Roland L.; and Pribyl, George E., 3,816,842.
Cirard, Philippe: *See—*
Chretien, Gilbert; Cirard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, 3,816,560.
Clack Corporation: *See—*
Clack, Willis E.; Kay, Clifford; and Nygren, Charles E., 3,815,747.
Clack, Willis E.; Kay, Clifford; and Nygren, Charles E., to Clack Corporation. Water softening systems. 3,815,747, Cl. 210-140.000.
Clancy, William B. Convertible floor sanitary inspection device. 3,816,738, Cl. 240-2.180.
Clark, Donald B.: *See—*
Brown, George T., Jr.; Clark, Donald B.; and Bayless, Robert G., 3,816,331.
Clark, James Elton, to Cantop Incorporated. Hermetically sealed tube for containing and dispensing viscous materials. 3,815,791, Cl. 222-326.000.
Clark, Willard F.: *See—*
Wilson, John S.; Clark, Willard F.; and Slykhouse, Thomas E., 3,816,191.
Claxton, George P.: *See—*
Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., 3,816,457.
Clemens, David H., to Rohm and Haas Company. Macroreticular sulfonated pyridine-divinylbenzene resins. 3,816,355, Cl. 260-2.10e.
Clemons, Paul W.: *See—*
United States of America, National Aeronautics and Space Administration, 3,815,205.
Clifford, Richard P., to TRW Inc. Electrostatic control method and apparatus. 3,816,772, Cl. 310-6.000.
Clottes, Georges: *See—*
Cayol, Andre; Chenal, Jean-Claude; Clottes, Georges; Schaller, Karl; Skok, Jean; and Venobre, Henri, 3,816,247.
Cayol, Andre; and Ratier, Jean-Louis, 3,816,248.
Cmelik K., Rudolf Max Helmut. Fluid mixture analyzer using a capacitive probe and voltage divider. 3,816,811, Cl. 324-61.00r.
CMI Corporation: *See—*
Allen, Thomas E., 3,815,622.
Coakley, Donald L. Inflatable funnel. 3,815,646, Cl. 141-337.000.
Coates, Clarence A., Jr.: *See—*
Weaver, Max A.; Pridgen, Herman S.; and Coates, Clarence A., Jr., 3,816,388.
Weaver, Max A.; and Coates, Clarence A., Jr., 3,816,392.
Coates, Clarence A., Jr.; and Weaver, Max A., to Eastman Kodak Company. 2-Amine-4-aryl-5-(2-cyano-4,6-dinitrophenylazo) thiazole compounds. 3,816,391, Cl. 260-158.000.
Coats Company, Inc., The: *See—*
Scott, Ray A.; Bossard, Fredrick R.; Strang, Elmer J.; and Mikovits, John L., 3,815,653.
Codorniu, Francisco Lorente, to Nordiska Maskinfilt Aktiebolaget. . 3,815,645, Cl. Machine cloth for the paper o.
Cohen, Marvin P.: *See—*
Von Strandtmann, Max; Cohen, Marvin P.; Klutchko, Sylvester; and Shavel, John, Jr., 3,816,466.
Colding, Bertil; Abramson, Nils; and Sandstrom, Unto, to Lasergruppen Konsalt AB. Device for measuring the displacement of a measuring point along at least two coordinate directions. 3,815,996, Cl. 356-106.000.
Cole, Edward L.: *See—*
Franz, William F., 3,816,240.
Cole, John Wayne; and Kick, Fred Ernest, to Abbott Laboratories. Purification method for TRH. 3,816,387, Cl. 260-112.500.
Cole, Robert B.: *See—*
Giffel, Byron B.; and Cole, Robert B., 3,816,644.
Coleman, Richard L.; Cummins, Billy H.; and Shillinglaw, John P., Jr., to Texaco Inc. Production of lubricating oils. 3,816,295, Cl. 208-86.000.
Colgate-Palmolive Company: *See—*
Lancz, Albert Jay, 3,816,351.
Colgate-Palmolive Company, mesne: *See—*
Schaar, Charles H., 3,816,227.
Colinet, Rene D. Electroslag melting process. 3,816,694, Cl. 219-73.000.
Collender, Robert Bruce. Unaided three dimensional aiming point photography and reproduction method and apparatus. 3,815,979, Cl. 352-38.000.
Collier, David: *See—*
Axelsson, Evald Gustav; and Collier, David, 3,815,478.
Collin, Henry A., III: *See—*
Collin, Henry A., Jr.; Eaton, James O.; Collin, Henry A., III; Pretzer, Jacob R.; and Stroot, Donald H., 3,815,683.
Collin, Henry A., Jr.; Eaton, James O.; Collin, Henry A., III; Pretzer, Jacob R.; and Stroot, Donald H., to Agristruction, Inc. Ripper assembly. 3,815,683, Cl. 172-677.000.
Collinge, Alfred E.; Neubeck, Clifford E.; and Udinsky, John R., to Rohm & Haas Company. Thermostable lactase. 3,816,259, Cl. 195-62.000.
Collins, James Benson; and Farrow, Frank William. Floating reservoir cover. 3,815,367, Cl. 61-1.000.
Collins Radio Company: *See—*
Hall, John C.; and Tribuno, Robert F., 3,816,718.
Sather, Delaine C., 3,816,733.
Tribuno, Robert F.; and Foster, Jimmie L., 3,815,850.
Colombo, Gregory R.: *See—*
Budd, Garland D.; Colombo, Gregory R.; and Waldo, Russell W., 3,816,686.
Colonial Mechandising Corporation: *See—*
Bosiger, J. Warren, 3,816,653.
Combustion Engineering, Inc.: *See—*
Bevilacqua, Frank, 3,816,245.
Regan, John William, 3,815,882.
Combustion Unlimited, Incorporated: *See—*
Straitz, John F., III, 3,816,059.
Cominco Ltd.: *See—*
McKay, Donald R.; Swinkels, Godefridus M.; and Szarmes, Kornel R. V., 3,816,105.
Commercial Metals Company: *See—*
Berry, Samuel M., 3,816,038.
Berry, Samuel M., 3,816,039.
Commissariat a l'Energie Atomique: *See—*
Cayol, Andre; and Ratier, Jean-Louis, 3,816,248.
Courcier, Francois; Blouet, Jean; Courtel, Robert; and Risler, Francis, 3,816,309.
Commissariat a l'Energy Atomique: *See—*
Cayol, Andre; Chenal, Jean-Claude; Clottes, Georges; Schaller, Karl; Skok, Jean; and Venobre, Henri, 3,816,247.
Communications Satellite Corporation: *See—*
Tomozawa, Atsushi; and Ford, Harold E., 3,816,666.
Computer Systems Engineering, Inc.: *See—*
Molloy, Kenneth H.; Ward, John P.; and Benson, Mark, 3,816,796.
Con-Ray, Inc.; a subsidiary of Red-Ray Manufacturing Company, Inc.: *See—*
Van Dyk, Garritt C., Jr., 3,815,488.
Concrete Conduit Company, Inc.: *See—*
Schille, Samuel C.; and Schack, John B., 3,815,304.
Conrad, Winthrop B., to Teleflex Incorporated. Method for manufacturing a gear wheel. 3,815,201, Cl. 29-159.200.
Conroy, Richard M.: *See—*
Pavlo, William A.; and Conroy, Richard M., 3,815,659.
Consolidated Natural Gas Service Company, Inc., mesne: *See—*
Eliot, Sigdon A., 3,816,064.
Consortium fur Elektrochemische Industrie G.m.b.H.: *See—*
Muller, Frank; Lohringer, Werner; Milles, Karl; Brauling, Herman; and Prigge, Helmut, 3,816,532.
Construction Specialties, Inc.: *See—*
Olsen, Robert W., 3,815,309.

Continental Oil Company: *See—*
Hunt, Mack W., 3,816,310.
McGuire, Lindell V.; and Sparlin, Derry D., 3,815,680.
Starks, Charles M., 3,816,512.

Control Data Corporation: *See—*
Chari, Srinivasan V., 3,816,776.
Ehrich, William G. E.; and Bigham, Jackson D., Jr., 3,816,645.

Conversion Chemical Corporation: *See—*
Brough, Richard W., 3,816,186.

Cook, Clayton C.; and Pope, Roy M., to Aluminum Company of America. Tapering fluidized bed chamber. 3,816,078, Cl. 23-277.00r.

Cook, Jay E. Ball receiving, metering and projecting system. 3,815,907, Cl. 273-30.000.

Cook, Lucien H., to Chemical Construction Corporation. Urea synthesis process. 3,816,528, Cl. 260-555.00a.

Cook, Norman K.: *See—*
Juelke, Charles V.; and Cook, Norman K., 3,816,520.

Cooley, Charles O. Magnetic phase difference meter. 3,816,814, Cl. 324-83.00a.

Cooley, Stone D.: *See—*
Barone, Bruno J.; and Cooley, Stone D., 3,816,540.

Cooper, Abraham J. Dental restoration jig. 3,815,236, Cl. 32-11.000.

Cooper, James Joseph, Jr.: *See—*
Toedtman, John August; and Cooper, James Joseph, Jr., 3,816,642.

Cooper, Jamshed Rustom, to Longyear Company. Adjustable mast for drilling apparatus. 3,815,690, Cl. 173-44.000.

Cooper, Julius, to Ideal Toy Corporation. Racing tops. 3,815,911, Cl. 273-86.00c.

Cooper, Roydon B., to Pall Corporation. Magnetic pressure indicator. 3,815,542, Cl. 116-70.000.

Copeland Corporation, mesne: *See—*
Rogers, Robert E.; and Davis, George F., Jr., 3,816,036.

Copeland, James S.: *See—*
Primm, Raymond; McKeown, William L.; and Copeland, James S., 3,816,745.

Copley Press, Incorporated, The: *See—*
Shimmin, Lawrence E., 3,815,457.

Coppoch, Walter J.; Amaroso, James R.; and Griffith, John Q., III, to Sun Oil Company of Pennsylvania. Lubricant for spindles, needles or twister rings. 3,816,346, Cl. 252-32.500.

Corban, Claudiu. Hole cutter for film covered packages. 3,816,017, Cl. 408-19.000.

Corey, Robert A. Construction siding members. 3,815,308, Cl. 52-316.000.

Corliss, Duncan S., to FMC Corporation. Stable dishwashing compositions containing sodium dichloroisocyanurate dihydrate. 3,816,320, Cl. 252-99.000.

Cornish, Alan H.: *See—*
Delaney, R. Edward; and Cornish, Alan H., 3,815,159.

Corson, Floyd L., to CPC International Inc. Process for the reactivation of powered carbon. 3,816,338, Cl. 252-420.000.

Cortimilia, Angelo J. Handrest attachment for artist's easel. 3,815,856, Cl. 248-118.000.

Coscia, Anthony Thomas; and Williams, Laurence Lyman, to American Cyanamid Company. Composition comprising a polysalt and paper made therewith. 3,816,556, Cl. 260-836.000.

Cosden Oil & Chemical Company: *See—*
Daniels, Calvin L.; and Boadle, Robert, 3,816,265.

Coster, John Lawrence Francis, to American Can Company. Method for protecting raw metal edge of inside lap of adhesively-bonded lap side seam tubular body. 3,816,206, Cl. 156-218.000.

Cottis, Steve G.: *See—*
Economy, James; Cottis, Steve G.; and Nowak, Bernard E., 3,816,417.

Courcier, Francois; Blouet, Jean; Courtel, Robert; and Risler, Francis, to Commissariat a l'Energie Atomique. Friction material. 3,816,309, Cl. 252-12.000.

Court, Patrick R., to Garrity, Paul G. Lighter with single member valve activator and spark generator support. 3,816,058, Cl. 431-254.000.

Courtel, Robert: *See—*
Courcier, Francois; Blouet, Jean; Courtel, Robert; and Risler, Francis, 3,816,309.

Couture, Robert L., to Eastman Kodak Company. Shutter mechanism. 3,816,843, Cl. 354-250.000.

Cowan, James J.: *See—*
United States of America, National Aeronautics and Space Administration, 3,815,969.

Cowles, Raymond I.: *See—*
Irish, Charles G., Jr.; Silva, Joseph W.; and Cowles, Raymond I., 3,815,507.

Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., to Pfizer Inc. Phenyl-alkanolamine, alkylamine and alpha-aminoalkyl ketone derivatives as heart stimulants. 3,816,516, Cl. 260-501.170.

Cox, Robert N., to Etamco Industries. Guarded insert and gadget supporting device. 3,815,756, Cl. 211-57.000.

CPC International Inc.: *See—*
Corson, Floyd L., 3,816,338.
Gibbons, John P.; and Wondolowski, Lawrence, 3,816,395.
Mudde, John P., 3,816,170.

Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., to Monsanto Company. Increasing the selectivity and yield in the production of carboxylic acids. 3,816,488, Cl. 260-413.00a.

Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., to Monsanto Company. Increasing the selectivity and yield in the production of carboxylic acids. 3,816,489, Cl. 260-413.000.

Craig, Glenn D.: *See—*
Lahaye, Paul G.; Craig, Glenn D.; and Turecek, Joseph L., 3,816,595.

Cramer, Richard D.: *See—*
Bilofsky, Ruth C.; and Cramer, Richard D., 3,816,119.

Crane, Jacob; Friedman, Sam; and Pryor, Michael J., to Olin Corporation. Copper base alloy. 3,816,109, Cl. 75-157.500.

Crask, Roy I.; and Egerer, William D., to Buckbee-Mears Company. Lightning arrester. 3,816,802, Cl. 317-16.000.

Craven, Eugene J.: *See—*
Brockway, Warren H.; and Craven, Eugene J., 3,815,216.

Creamer, Charles Edward, to Union Carbide Corporation. Polysiloxane carbamate compounds. 3,816,359, Cl. 260-2.50s.

Creighton, Stephen M., to Hooker Chemical Corporation. Hydroxyaryl adducts of decachloropentacyclo ($5.3.0.0^{2,6}.0^{3,10}.0^{5,9}$) decane-3-one and esters thereof. 3,816,543, Cl. 260-619.00d.

Cremean, Stephen P.: *See—*
Reid, Edward A., Jr.; and Cremean, Stephen P., 3,815,489.

Critchfield, Frank E.; and Koleske, Joseph V., to Union Carbide Corporation. Graft copolymers of lactone polyesters and blends thereof with/PVC. 3,816,566, Cl. 260-898.000.

Croft, Thomas S.; and La Mar Zollinger, Joseph, to Minnesota Mining and Manufacturing Company. α~ω-Di-s-triazinyl perfluorooxaalkanes. 3,816,416, Cl. 260-248.0cs.

Cross, Barrington; and Feeny, Richard William, to American Cyanamid Company. Substituted S-triazines. 3,816,419, Cl. 260-249.900.

Cross Manufacturing, Inc.: *See—*
Ailshie, Roger H.; and McMillen, Kenneth G., 3,815,477.

Crovetti, Aldo Joseph; and Lynch, Donald Murl, to Abbott Laboratories. Maleimide derivatives as plant growth regulators. 3,816,451, Cl. 260-326.5fm.

Crowle, Brian, to Intergrated Photomatrix Ltd. and Method and circuit element for the selective changing of a semiconductor diffusion region. . 3,816,769, Cl. 307-304.000.

Crown Cork & Seal Company, Inc.: *See—*
Kneusel, Raymond H. P., 3,815,534.

Crutcher, Calvin, to Stanray Corporation. Seamed joint for railway car roof sheets. 3,815,296, Cl. 52-45.000.

Crystal-X Corporation: *See—*
Delmar, John Kenneth, 3,815,649.

Cucuo, Benjamin J., to Pioneer Packaging, Inc. Carton. 3,815,735, Cl. 206-485.000.

Cummings, Arthur Truman: *See—*
Nelson, Theodore C.; and Cummings, Arthur Truman, 3,815,234.

Cummins, Billy H.: *See—*
Coleman, Richard L.; Cummins, Billy H.; and Shillinglaw, John P., Jr., 3,816,295.

Cunningham, Andrew L., Sr., to Lockheed Aircraft Corporation. Process for surface treatment of graphite fibers. 3,816,598, Cl. 423-447.000.

Cunningham, George R.: *See—*
Hoke, Kenneth E.; Cunningham, George R.; and Greene, Jerrold W., 3,815,762.

Cuomo, Jerome J.: *See—*
Ahn, Kie Y.; and Cuomo, Jerome J., 3,816,223.

Cuomo, Jerome J.; Laibowitz, Robert B.; Mayadas, Ashok F.; and Rosenberg, Robert, to International Business Machines Corporation. Single crystal tunnel devices. 3,816,845, Cl. 357-5.000.

Curelop, Edward J. Method for preparing texturized cathodes. 3,816,180, Cl. 136-120.00r.

Curran, Patrick M.; Brazer, Geoffrey R.; and Erickson, John S., to United Aircraft Corporation. Process for reducing oxide defects in investment castings. 3,815,661, Cl. 164-134.000.

Curtis, William R.; and Trimble, David C., to Hercules Incorporated. Plastic spring. 3,815,887, Cl. 267-91.000.

Curtis-Wright Corporation: *See—*
Watts, Hargus, 3,815,342.

Cusack, Noel James: *See—*
Shaw, Gordon; and Cusack, Noel James, 3,816,399.

Custis, Irving H.: *See—*
Carreras, Edmond J.; and Custis, Irving H., 3,816,230.

Cutler-Hammer, Inc.: *See—*
Wentworth, Firzwilliam Allan, 3,816,724.
Wright, James C.; and Reed, Reginald A., 3,815,723.

Cyclone Seeder Company, Inc., The: *See—*
Bowerman, Paul Lee, 3,815,825.

Dacam Corporation: *See—*
Cato, Carl P., 3,815,483.

Daddona, Domenic John, Jr., to Scovill Manufacturing Company. Waistband fastener. 3,815,183, Cl. 24-227.000.

Dahl, G. W., Co., Inc.: *See—*
Slawson, Richard S.; and Nazareth, Alfred, Jr., 3,816,760.

Dahl, Thor, Inc.: *See—*
Berger, Richard F., 3,815,325.

Daicel Ltd.: *See—*
Ishii, Kiyoshi; Kojima, Katumi; and Ishikawa, Kazuo, 3,816,150.

Daiga, Valdis R., to Owens-Illinois, Inc. Powders of metal, silver and gold. 3,816,097, Cl. 75-.50a.

Daniels, Arthur L.: *See—*

Brower, Frank M.; Daniels, Arthur L.; and Fujioka, George S., 3,816,192.

Daniels, Calvin L.; and Boadle, Robert, to Cosden Oil & Chemical Company. Distillation of readily polymerizable ethylenically unsaturated aromatic hydrocarbon compounds with N-nitrosodiphenylamine. 3,816,265, Cl. 203-9.000.

Daniels, Dennis, to U. S. Amada, Ltd. and N.C. automatic folding machine. . 3,815,393, Cl. 72-7.000.

Daniels, Dennis, to U. S. Amada Ltd. and Punching-fabricating apparatus interface mechanism. . 3,815,403, Cl. 72-405.00.

Daniels, Dennis, to U.S. Amada, Ltd. Unitized tooling. 3,815,459, Cl. 83-140.000.

Danis, Louis J. Cooking utensil. 3,815,575, Cl. 126-390.000.

Danneberg, Peter: *See—*
Bauer, Adolf; Weber, Karl Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, 3,816,409.

Darbee, Paul V. Dynamic graphic display system. 3,815,986, Cl. 355-1.000.

Darf Corporation: *See—*
Sell, Abdul Harry, 3,815,343.

Dart Industries Inc.: *See—*
Campagna, Edward R., 3,815,865.

Data Input device: *See—*
Nakamura, Tadahiko, 3,816,770.

Data Interface, Inc., mesne: *See—*
Ott, Owen J.; and Ginn, David W., 3,816,799.

David, Anton: *See—*
Belart, Juan; and David, Anton, 3,815,961.

David, Fernand Antoine, to Ateliers Henri Lardet. Apparatus for the production of gas. 3,815,553, Cl. 122-235.00r.

Davies, Robert William; and Thornton, Leonard, to Molins Limited. Adhesive-applying apparatus. 3,815,822, Cl. 239-125.000.

Davis, Austin E.; and Agostino, Peter A., to Nashua Corporation. Electrophotographic copy systems. 3,815,989, Cl. 355-10.000.

Davis, Benjamin; and Phillipps, Gordon Hanley, to Glaxo Laboratories Limited. Anaesthetic steroids. 3,816,624, Cl. 424-243.000.

Davis, Billy E.; and Dunegan, Ronald G., to Signet Controls Incorporated. Leak detector for detecting leakage in a meter prover system. 3,815,406, Cl. 73-46.000.

Davis, George F., Jr.: *See—*
Rogers, Robert E.; and Davis, George F., Jr., 3,816,036.

Davison, Ellison L.; and Deutsch, Monroe K., to Mine Safety Appliances Company. Adjustable ear covers for safety hats. 3,815,155, Cl. 2-209.000.

Davmor Industries, Inc.: *See—*
Reid, Edward A., Jr.; and Cremean, Stephen P., 3,815,489.

Dawdy, Jack A.; and Winkowski, Daniel A., to National Gypsum Company. Concealed fastening of predecorated wallboard. 3,816,199, Cl. 156-71.000.

Day, William H., to General Electric Company. Power augmenter bucket tip contruction for open-circuit liquid cooled turbines. 3,816,022, Cl. 416-92.000.

De Pauw, Robert C. Color blending set and paint mixing tray. 3,815,265, Cl. 35-28.500.

De Pont de Nemours, E. I., and Company: *See—*
Popowich, Michael John, 3,816,348.

De Santis, Louis. Sheet metal cutting device. 3,815,228, Cl. 30-124.000.

Dear, Terrence A.; Lechner, Alfred; and Swartout, Willson C., to Du Pont de Nemours, E. I., and Company. Electrical deplating read-out apparatus. 3,816,713, Cl. 235-92.0mt.

Debrunner, Hans Ulrich. Device for the measurement of the angle of kyphosis. 3,815,247, Cl. 33-75.00r.

DEC International, Inc.: *See—*
Petranyi, John F., 3,815,792.

Decamps, Alain: *See—*
Sarot, Pierre; Delattre, Michel; and Decamps, Alain, 3,816,319.

Decupper, Jean Alexandre, to Detec S.A. Apparatus for disinfecting an area with formaldehyde. 3,816,074, Cl. 21-110.000.

Deere & Company: *See—*
Nelson, Leon Franklin, 3,815,346.

Deering Milliken Research Corporation: *See—*
Wethington, Charles A., 3,816,215.

Deffenbaugh, James F., to Wean United, Inc. Flash welders. 3,816,695, Cl. 219-100.000.

DeGarmo, Ray G. Nevigational computer. 3,816,716, Cl. 235-150.200.

DeHaai, Kermit M. Wier stretcher. 3,815,180, Cl. 24-71.200.

Delalande S.A.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Raynaud, Guy M.; and Pourrias, Bernard M., 3,816,415.

Delamere & Williams Company Limited: *See—*
Brooks,Arthur Alan, 3,815,316.

Delaney, R. Edward; and Cornish, Alan H., to Koehler-Dayton, Inc. Sewerage treatment system. 3,815,159, Cl. 4-10.000.

Delattre, Michel: *See—*
Sarot, Pierre; Delattre, Michel; and Decamps, Alain, 3,816,319.

Dellian, Kurt A.; and Furia, Thomas A., to Ciba-Geigy Corporation. Coloring hydrophobic fibers using carrier of halogenated hydroxybiphenylether. 3,816,071, Cl. 8-173.000.

Delmar, John Kenneth, to Crystal-X Corporation. Cartridge pack for trash compaction machine. 3,815,649, Cl. 150-1.000.

DeLorean, John Z.; and Lindbert, Brook A., to General Motors Corporation. Automotive vehicle. 3,815,703, Cl. 180-91.000.

Demember, John R.; Haas, Howard C.; and Reid, Jerome L., to Polaroid Corporation. Photographic products and processes. 3,816,125, Cl. 96-3.000.

Denbleyker, John R.: *See—*
Zwiep, Theodore C.; and Denbleyker, John R., 3,815,730.

Denki Onkyo Co., Ltd.: *See—*
Masuda, Noboru; Kuroyanagi, Masasi; and Matukawa, Takashi, 3,816,826.

Denniston, Rollin H., III, to Medtronic, Inc. Muscle stimulation and/or contraction detection device. 3,815,611, Cl. 128-419.00d.

Dentipressions Inc.: *See—*
Baskas, Morris J.; and Kaufman, Harry, 3,815,878.

Denton, Michael Wade. Methods and apparatus for forming seams. 3,815,530, Cl. 112-214.000.

DePrima, Anthony E.: *See—*
Fox, Daniel W., 3,816,007.

Derdowski, Ronald A.; Hayner, Don S.; and Parker, Frank S., to Newcor, Inc. Sheet thickness detector and attachment locator. 3,816,697, Cl. 219-107.000.

Derrick Manufacturing Corporation: *See—*
Jones, Clarence O., Jr., 3,815,473.

Design Systems, Inc.: *See—*
Streander, George W., 3,815,245.

Detec S.A.: *See—*
Decupper, Jean Alexandre, 3,816,074.

Detection Systems, Inc.: *See—*
06/11/74; and McMaster, Richard Louis, 3,816,755.

Detroit Bullet Trap Corporation: *See—*
Nikoden, Joseph, Jr., 3,815,520.
Nikoden, Joseph, Jr., 3,815,914.

Deussner, Herbert, to Klockner-Humboldt Duetz Aktiengesellschaft. Cooling material from a kiln. 3,815,253, Cl. 34-20.000.

Deutsch, Monroe K.: *See—*
Davison, Ellison L.; and Deutsch, Monroe K., 3,815,155.

Deutsche Gold- Und Silber Scheideanstalt vormals Roessler: *See—*
Schmidt, Wilhelm; and Schindler, Herward, 3,816,612.

Deutsche Gold- und Silber-Scheideanstalt vormal Roessler: *See—*
Schreyer, Gerd; Schwarze, Werner; Weigert, Wolfgang; and Horst, Weigel, 3,816,525.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Kempermann, Theo; and Eholzer, Ulrich, 3,816,323.
Kleemann, Axel; Schreyer, Gerd; and Weiberg, Otto, 3,816,479.

Deutsche Nemectron Gesellschaft m.b.H.: *See—*
Bar, Hugo, 3,815,595.

Device for measuring the opacity of smokes: *See—*
Bignardi, Luigi, 3,816,004.

DeWoskin, Irvin S.; and Jenkins, Murgatroyd H., to Beltx Corporation. Sanitary garments and methods of and apparatus for their manufacture. 3,816,209, Cl. 156-251.000.

Deyerle, William Minor. Off-set trial prosthesis device and method for hip prosthesis surgery. 3,815,590, Cl. 128-92.0eb.

Deyerle, William Minor. Femoral shaft surgical rasp for use in hip prosthesis surgery. 3,815,599, Cl. 128-305.000.

Di Rago, Michael, to Ogar Manufacturing Corporation. Joint assembly for a feeler gauge blade holder. 3,816,010, Cl. 403-157.000.

Diamond International Corporation: *See—*
Peppler, William S., 3,816,049.

Diederen, Willie: *See—*
Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; and Diederen, Willie, 3,816,403.

Diehl: *See—*
Tieben, Heinz, 3,815,504.

Dietrich, Catherine Coleman: *See—*
Dietrich, Howard H., deceased, 3,815,713.

Dietrich, Howard H., deceased (by Dietrich, Catherine Coleman; executrix). Clutch released brake lock. 3,815,713, Cl. 192-13.00a.

Dietrich Manufacturing Inc.: *See—*
Dietrich, William J., Sr., 3,815,958.

Dietrich, William J., Sr., to Dietrich Manufacturing Inc. Assembly for attaching auxiliary wheels to a tractor. 3,815,958, Cl. 301-41.00r.

Dietzgen Corporation: *See—*
Brownscombe, Philip J., 3,815,975.

Dinnerstein, Albert J.: *See—*
Willinger, Allan H.; and Dinnerstein, Albert J., 3,815,547.

Direccion General de Investigacion y Desarrollo (DIGID): *See—*
Infantino, Osvaldo Cesar, 3,815,503.

Dobbins, John B. Roller, Hopper, scatter shield and brake assembly for precision seeding. 3,815,527, Cl. 111-11.000.

Dobrokhotov, Sergei Alexandrovich: *See—*
Kainson, Anatoly Yakovlevich; Razygraev, Jury Sergeevich; Sorokin, Nikolai Elizarovich; Dobrokhotov, Sergei Alexandrovich; Sokolov, Veniamin Prokofievich; Zaitsev, Nikolai Ivanovich; Zandman, Boris Genikhovich; Telyatnikov, Boris Peisakhovich; Kholin, Nikoai Dmitrievich; and Ryazanov, Alexei Nikolaevich, 3,815,525.

Doe, Lester Adrian, Jr.: *See—*
Koloch, Klaus E.; and Doe, Lester Adrian, Jr., 3,816,562.

Doherty, Norman R. Needleless inoculator. 3,815,594, Cl. 128-173.00h.

Dohshita, Hidetoshi: *See—*
Suda, Toshi; Akashi, Tetsuji; and Dohshita, Hidetoshi, 3,815,564.

Dokken, Roger Nels: *See—*
Bauer, Edwin Francis; Dokken, Roger Nels; Hard, Robert Amos; and Malhota, Umesh Kumar, 3,816,720.

Dollarhide, Francis E.: *See—*

Griffin, Thomas J.; and Dollarhide, Francis E., 3,816,322.
Donnelly Mirrors, Inc.: *See—*
Kurz, Arthur W., Jr., 3,815,976.
Donohue, James M.; and Gerbasi, Dennis P., to Xerox Corporation. Toner reclaiming method. 3,816,157, Cl. 117-19.000.
Dorlars, Alfons: *See—*
Ohlschlager, Hans; Riester, Oskar; and Dorlars, Alfons, 3,816,138.
Dorn, Conrad P., Jr., to Merck & Co., Inc. 4-Benzothiazol-2-yl)-fluorophenylacetic acids. 3,816,443, Cl. 260-304.000.
Dorr-Oliver Incorporated: *See—*
Rosenquest, John B., Jr., 3,816,034.
Dostmann, William R.: *See—*
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Double B Construction & Incinerator Upgrading Co., Inc.: *See—*
Bobrowsky, Charles A.; and Loise, Joseph A., 3,815,332.
Douglas, George H.; Faust, Warren R.; and Smith, Herchel, to American Home Products Corporation. Process for preparing 6-methylated steroids. 3,816,481, Cl. 260-397.400.
Dow, Bobby F.; and Fellner, Herbert G., to Emerson Electric Co. Thrust load equalizer for an electric motor. 3,816,782, Cl. 310-90.000.
Dow Chemical Company, The: *See—*
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Brower, Frank M.; Daniels, Arthur L.; and Fujioka, George S., 3,816,192.
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Dowdall, Dennis Stephen; and Price, Peter Ernst Dieter, to Telektron Limited. Fluid control valves. 3,815,634, Cl. 137-627.500.
Downen, Jim L.: *See—*
Sutliff, Wayne N.; and Downen, Jim L., 3,815,693.
Dravnieks, Andrew, to IIT Research Institute. Method of analyzing odors. 3,815,405, Cl. 73-23.000.
Drax, Heinz; and Stut, Hans, to Siemens Altiengesellschaft. Sensing minor brightness differences in the television image in a system for zone-melting of a semiconductor. 3,816,650, Cl. 178-6.800.
Dreier Brothers, Inc.: *See—*
Dreier, Raymond C., 3,815,648.
Dreier, Raymond C., to Dreier Brothers, Inc. Blade holder. 3,815,648, Cl. 145-33.00a.
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Read, Norman W., 3,815,676.
Dreyer, Gunter: *See—*
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Dubouchet, Jacques L., to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Apparatus for and method of automatically removing pollutants from a flowing stream. 3,815,742, Cl. 210-83.000.
Dubs, Paul; and Pesaro, Mario, to Givaudan Corporation. Certain 2-substituted-Δ^3-thiazolines. 3,816,445, Cl. 260-306.700.
Duck, Sherman W.; Jeffers, Frederick J.; and Lemke, James U., to Bell & Howell Company. Magnetic imaging. 3,815,987, Cl. 355-3.00r.
Duda, John Larry: *See—*
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Dufour, Charles H., to Harris-Intertype Corporation. Jam detector system. 3,815,895, Cl. 270-56.000.
Dukowicz, John K.; Hoppie, Lyle O.; and Wang, Tsih C., to General Motors Corporation. DC magnetic propulsion and levitation system for high speed vehicles. 3,815,511, Cl. 104-148.0lm.
Duncan, William Lankford; and Heitz, Ronald George, to Du Pont de Nemours, E. I., and Company. Measuring length and velocity of single staple fibers within an airflow. 3,816,001, Cl. 356-167.000.
Dunegan, Ronald G.: *See—*
Davis, Billy E.; and Dunegan, Ronald G., 3,815,406.
Dunn, Elmer M. Apparatus for treating fabric items. 3,815,872, Cl. 251-323.000.
Duran, Ondrej; and Radic, Rudolf, to Vyskumny ustav mechanizacie a automatizacie. Multioperation machine with circular movement. 3,815,402, Cl. 72-404.000.
Duranleau, Roger G.: *See—*
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Duranleau, Roger G.; and Love, Richard F., to Texaco Inc. Preparation of lactams. 3,816,410, Cl. 260-239.30a.
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Roh, Peter; and Strunk, Manfred, 3,815,505.
Dziomba, Willy; Beule, Rainer; Dreyer, Gunter; and Wolf, Gerhard, to Volkswagenwerk Aktiengesellschaft. Measuring and/or control device for the setting of the constituents of a chemical solution especially of a galvanic bath. 3,815,620, Cl. 137-90.000.
Dzus Fastener Co., Inc.: *See—*
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Eames, Wilmer B. Wedge for dental matrix bands. 3,815,243, Cl. 32-63.000.
East Coast Equipment Corporation: *See—*
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Eberle, Jeannine A.: *See—*
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Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; and Diederen, Willie, to Boehringer Ingelheim GmbH. Digitoxsyl acrylonitrile derivatives. 3,816,403, Cl. 260-210.500.
Ebert, Edward A. Device for heating thermoplastic heating device. 3,816,705, Cl. 219-521.000.
Eccleston, Kenneth Thomas; and Frizzell, John George, to Foseco International Limited. Methods of and apparatus for loading automatic hot topping apparatus with hot topping slabs. 3,815,210, Cl. 29-252.000.
Eccleston, Kenneth Thomas; and Fieldhouse, Roger, to Foseco International Limited. Expansible frame hot topping apparatus. 3,815,664, Cl. 164-339.000.
Eckel, Oliver C. Acoustical panel assembly and method of forming it. 3,816,225, Cl. 161-43.000.
Eco-Control, Inc.: *See—*
Walsh, Myles A., 3,816,177.
Economy, James; Cottis, Steve G.; and Nowak, Bernard E., to Carborundum Company, The. Tris(p-carbophenoxyphenyl) cyanurate. 3,816,417, Cl. 260-248.0cs.

Edenhofer, Albrecht; Ramuz, Henri; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. 4-[3-(4-Phenyl-piperidino)-2-hydroxy-propoxy] benzophenones. 3,816,434, Cl. 260-293.800.

Eder, Ulrich; and Sauer, Gerhard, to Schering AG. 2-2-Disubstituted cycloalkane-1,3-diones. 3,816,536, Cl. 260-586.00r.

Edney, Carl: *See*—
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Edwards, Bryant, to Illinois Tool Works Inc. Continuous Motion container molding method. 3,816,585, Cl. 264-297.000.

Egawa, Hitoshi: *See*—
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Eggers, Joachim; and Buschmann, Hans-Theo, to Agfa-Gevaert Aktiengesellschaft. Photographic production of phase holograms and developing with a non-tanning developer. 3,816,130, Cl. 96-27.00h.

Egri, Alajos: *See*—
Apostol, Tamas; Barna, Janos; Egri, Alajos; Kaplar, Zsigmond; and Majtenyi, Tibor, 3,815,835.

Eholzer, Ulrich: *See*—
Kempermann, Theo; and Eholzer, Ulrich, 3,816,323.

Ehrich, William G. E.; and Bigham, Jackson D., Jr., to Control data Corporation. Communications system. 3,816,645, Cl. 178-2.00r.

Eiben, Siegfried: *See*—
Hoffman, Udo; and Eiben, Siegfried, 3,816,710.

Eichenauer, Fritz: *See*—
Meywald, Klaus, 3,816,706.

Eiermann, Dankwart, to Audi Nsu Auto Union Aktiengesellschaft and Wankel G.m.b.H. Oil seal for rotary mechanism. 3,816,041, Cl. 418-142.000.

Eisner, Elmer, to Texaco Inc. Method for determining optimum seismic pulse. 3,815,704, Cl. 340-15.50r.

Ekholm, Rolf G.: *See*—
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Eldridge, Jerome Michael; and Matisoo, Juri, to International Business Machines Corporations. . 3,816,173, Cl. Fabrication of variable curre.

Electro-Nite Co.: *See*—
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Electronic devices for the programmed tracing of patterns: *See*—
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Electronic Memories and Magnetics Corporation: *See*—
Krag, Niels; Hernandez, Ernest S.; and Horvath, Kalman, 3,816,205.

Electronics Corporation of America: *See*—
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Electrosil Limited: *See*—
Gooding, Trevor Frank John; and Howse, Geoffrey David Stuart, 3,815,225.

Electrospace Corporation: *See*—
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Elevator Corporation: *See*—
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Eliot, Sigdon A., to Consolidated Natural Gas Service Company, Inc., mesne. Forge furnace. 3,816,064, Cl. 432-34.000.

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Nemec, Jiri; Bures, Ladislav; and Rajnoha, Jaroslav, 3,815,347.
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Elmore, Austin E.; and Uhlmann, Ernest A. Drain port valve and improved shipping container. 3,815,772, Cl. 217-3.0bc.

Elwood, Albert A. Radio receiving station. 3,816,832, Cl. 343-112.00d.

Ely, Donald A., to Beloit Corporation. Grooved dryer. 3,815,256, Cl. 34-111.000.

Emerson Electric Co.: *See*—
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Emerson, Reginald Stanley, to Hartridge, Leslie, Limited. Engine test equipment. 3,815,411, Cl. 73-117.300.

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Engdahl, Rodney A.: *See*—
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Engel Industries, Inc.: *See*—
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Engel, Phillip Knox: *See*—
Serban, Alexander; and Engel, Phillip Knox, 3,816,473.

Engel, Walter H., to Porosan Interests, U.S.A., Inc. Imperforate dispenser for dispensing volatile matter as gas and/or vapor to a surrounding atmosphere and method for forming same. 3,815,828, Cl. 239-56.000.

Engelhard Minerals & Chemicals Corporation: *See*—
Zentz, William E., Jr., 3,816,153.

Engels, Gerbrand. Clock repair jig. 3,815,893, Cl. 269-98.000.

Enslin, Nicholas Charl de Villiers; and Chapman, John Austin Charles, to Time Modulation (Proprietary) Limited. Changing the frequency of a polyphase alternating current supply and apparatus therefor. 3,816,808, Cl. 321-61.000.

Envirotech Corporation: *See*—
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Epicure Products, Inc.: *See*—
Burhoe, Winslow N., 3,815,707.

Erdmann, Dietrich; Schuhrer, Klemens; Koch, Wolfgang; and Gerhart, Schneider, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for preparing furanones. 3,816,464, Cl. 260-343.600.

Eremin, Vladimir Alexandrovich: *See*—
Mikhailov, Evgeny Leonidovich; Boiko, Valery Ivanovich; Nikolaev, Peter Ivanovich; Melnikov, Innokenty Alexandrovich; Eremin, Vladimir Alexandrovich; Revazov, Vyacheslav Georgievich; Jurievich, Jury Iosifovich; and Losev, Gennady Evgenievich, 3,815,879.

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Ericson, John F. E.: *See*—
Lund, Harold E.; and Ericson, John F. E., 3,815,767.

Eschenbacher, Rolf; and Steinbrenner, Hans-Gunter, to Warner Electric Brake & Clutch Company. Ball screw mechanism with improved ball guide. 3,815,435, Cl. 74-459.000.

Esmay, Edward N., to Xerox Corporation. Shaft coupling apparatus. 3,815,380, Cl. 64-4.000.

Esquire, Inc.: *See*—
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Esso Production Research Company: *See*—
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Esso Research and Engineering Company: *See*—
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Rapoza, Edward J.; Siegel, Maxwell E.; Estelle, Weems E.; Petrucci, Pasquale M.; Linarducci, Joseph S.; Hamma, John; and Montgomery, John, 3,815,769.

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Etablissements Muller & Cie: *See*—
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Etamco Industries: *See*—
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Ethyl Corporation: *See*—
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Ethyl Development Corporation: *See*—
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Evans & Sutherland Computer Corporation: *See*—
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Evans, Anthony G.: *See*—
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., 3,816,516.

Evans, Arthur G. Convertible pedestal steering apparatus. 3,815,537, Cl. 114-144.00r.

Evans, David J. I.: *See*—
Mackiw, Vladimir N.; Weir, Donald R.; Evans, David J. I.; and Maschmeyer, Dennis G., 3,816,098.

Evans, Joseph H., to Raychem Corporation. Reversible thermochromic ionically and radiation cross-linked polymers containing cabaltous ions. 3,816,335, Cl. 252-408.000.

Evans, Ralph E.; and Blower, Howard E., to Armco Steel Corporation. Method of making an improved slot drainage culvert. 3,815,213, Cl. 29-446.000.

Everlast World Boxing Headquarters Corporation: *See*—
Golomb, David L., 3,815,905.

Eversteijn, Franciscus Cornelis; and Peek, Hermanus Leonardus, to U.S. Philips Corporation. Vapor depositing method. 3,816,166, Cl. 117-106.000.

Fabbrica Automobili Isotta Fraschini e Motori Breda S.p.A.: *See*—
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Fabrique d'Horlogerie CHS. Tissot & Fils S.A.: *See*—
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Fabry, Donald F.: *See*—
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Faconti, Victor, Jr., to Singer-General Precision, Inc. Phase-oriented display. 3,815,261, Cl. 35-12.00f.

Fahrenholtz, Kenneth Earl, to Hoffmann-La Roche Inc. Steroidal azolide-l-carboxylates. 3,816,412, Cl. 260-239.500.

Fairchild Camera and Instrument Corporation: *See*—
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Fanta, Wayne I., to Procter & Gamble Company, The. Insecticidal esters of chrysanthemic acid and alcohols related to 3-hydroxymethylbenzofuran. 3,816,469, Cl. 260-346.20r.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
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Pelster, Gerd; Wurtz, Volkmar; and Feess, Erich, 3,816,067.
Weyer, Rudi; Aumuller, Walter; Schweitzer, Roland; Weber, Helmut; and Hubner, Manfred, 3,816,424.

Farbwerke Hoeschst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
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Farmer, John E., to Farmer Mold & Machine Works, Inc. Molten metal delivery system. 3,815,623, Cl. 137-142.000.

Farmer Mold & Machine Works, Inc.: *See*—
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Farone, Eugene Richard, to Lubrizol Corporation, The. Solid, curable compositions containing oxoalkyl acrylamides. 3,816,559, Cl. 260-857.000.

Farrell, John J. Balloon blown plastic molding. 3,816,046, Cl. 425-242.00b.

Farrell, Thomas C.; and Fisher, Harry W., to Rockwell International Corporation. Valve assembly. 3,815,627, Cl. 137-48.00c.

Farrow, Frank William: *See*—
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Fastener Engineers, Inc.: *See*—
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Fattori, Silvano: *See*—
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Fauran, Claude P.; Eberle, Jeannine A.; Raynaud, Guy M.; and Pourrias, Bernard M., to Delalande S.A. Derivatives of 1,7,7-trimethyl-2-norbornane-2'-spiro-1',3'-dioxolane. 3,816,415, Cl. 260-247.70e.

Faure, Jacques: *See*—
Rosenbaum, Barry M.; Tegge, Bruce R.; Faure, Jacques; and Love, James H., 3,816,379.

Faust, Elbert R., to Buehler Corporation, The, mesne. Continuous plating system. 3,815,617, Cl. 134-133.000.

Faust, Warren R.: *See*—
Douglas, George H.; Faust, Warren R.; and Smith, Herchel, 3,816,481.

Faustel, Inc.: *See*—
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Fauth, Otto: *See*—
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Favereau, Michel, to Thomson-CSF. Optical device for telecine systmes. 3,816,655, Cl. 178-7.880.

Federal Paper Board Company, Inc.: *See*—
Ganz, Robert H., 3,815,320.

Federspiel, Joseph A., to FMC Corporation. Hitch assembly. 3,815,687, Cl. 172-801.000.

Feedmatic-Detroit, Inc.: *See*—
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Feeny, Richard William: *See*—
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Feess, Erich: *See*—
Pelster, Gerd; Wurtz, Volkmar; and Feess, Erich, 3,816,067.

Feinberg, Jacob Howard, to American Can Company. Poly (vinyl pyrrolidone) stabilized polymerized epoxy compositions and process for irradiating same. 3,816,281, Cl. 204-159.110.

Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, to Lovens Kemiske Fabrik Produktionsaktieselskab. Sulfamylbenzoic acids. 3,816,482, Cl. 260-397.70r.

Feldman, Gustav. Apparatus and method for selectively backlighting printed circuit board perforations to accurately locate electrical component leads therein. 3,815,204, Cl. 29-203.00b.

Fellner, Herbert G.: *See*—
Dow, Bobby F.; and Fellner, Herbert G., 3,816,782.

Felsman, Robert A.: *See*—
Floyd, Malcolm O., 3,815,832.

Felten, Gilbert A., to Goodyear Tire & Rubber Company, The. Tire building drum. 3,816,218, Cl. 156-398.000.

Ferlux: *See*—
Tronche, Pierre A., 3,816,470.

Ferrero, P., & C. S.p.A.: *See*—
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Ferrill, Homer E., to Dresser Industries, Inc. Pressure relief system. 3,815,628, Cl. 137-492.500.

Fiedler, George C., to McDonnell Douglas Corporation. Three axes alignment means. 3,816,000, Cl. 356-152.000.

Fieldcrest Mills, Inc.: *See*—
Moore, James Melvin; Newell, William Gilbert; Hampton, Anthony Everette; and Jackson, Philip Elmo, 3,815,179.

Fieldhouse, Roger: *See*—
Eccleston, Kenneth Thomas; and Fieldhouse, Roger, 3,815,664.

Fierro Esponja, S.A.: *See*—
Celada, Juan; Mackay, Patrick W.; and Martinez, Enrique R., 3,816,102.

Finch, Neville, to Ciba-Geigy Corporation. Tetrahydroisoxazolo(5,4-c)isoquinolines. 3,816,429, Cl. 260-288.00r.

Fine, Leonard Wolfe; Grayson, Martin; and Grayson, Suggs. Bleaching compositions containing a N-acyl azole. 3,816,324, Cl. 252-186.000.

Finelli, Thomas M., to Avco Corporation. Fire protection material. 3,816,226, Cl. 161-48.000.

Fiore, John M., to Bio-Analytical Laboratories, Inc. Speculum barrel and retainer ring assembly. 3,815,584, Cl. 128-6.000.

Fiore, John M., to Bio-Analytical Laboratories, Inc. Disposable vaginal speculum. 3,815,585, Cl. 128-17.000.

Fiore, Peter O., to Texas Instruments, Incorporated. Pressure responsive device having improved means for calibration. 3,816,685, Cl. 200-83.00s.

Firma Gebr. Batz, Heiligenhaus: *See*—
Hopp, Werner, 3,815,184.

Fisch, Willy: *See*—
Schmid, Rolf; Lohse, Friedrich; Fisch, Willy; and Batzer, Hans, 3,816,365.

Fischer, Artur. Anchoring assembly. 3,815,467, Cl. 85-77.000.

Fisher, Harry W.: *See*—
Farrell, Thomas C.; and Fisher, Harry W., 3,815,627.

Fitzgerald, Jim W.: *See*—
Wright, Leslie I.; and Fitzgerald, Jim W., 3,815,844.

Fitzgerald, Maurice J., to Polaroid Corporation. Synthetic silver halide emulsion binder. 3,816,129, Cl. 96-114.000.

Flannery, John B., Jr.: *See*—
Haas, Werner E. L.; Flannery, John B., Jr.; Mechlowitz, Bela; and Adams, James E., 3,816,113.

Flextrac Nodwell Ltd.: *See*—
Bamford, Michael A. T., 3,815,817.

Flis, Albert J. Easily replaceable EDM electrode. 3,816,691, Cl. 219-69.00e.

Florian, Berkeley J. Rotary shear with pickup finger and pressure release. 3,815,230, Cl. 30-178.000.

Floyd, Malcolm O., 40% to Felsman, Robert A. Sprinkler apparatus. 3,815,832, Cl. 239-563.000.

Fluegel, Dale A., to Phillips Petroleum Company. Incremental vertical sweep system for display of information in selected horizontal bands on a CRT. 3,816,791, Cl. 315-18.000.

Fluid Energy Processing & Equipment Company: *See*—
Van Vliet, Edward; and Dostmann, William R., 3,815,833.

Flynn, Jac B.; and Priese, Werner K., to Hills McCanna Company. Metering pump. 3,816,032, Cl. 417-388.000.

FMC Corporation: *See*—
Barney, Harry E., Jr.; and Engdahl, Rodney A., 3,815,490.
Corliss, Duncan S., 3,816,320.
Federspiel, Joseph A., 3,815,687.
Gibbons, Loren K., 3,816,090.
Gibbons, Loren Kenneth; and Ramsey, Arthur Albert, 3,816,420.
Gibbons, Loren Kenneth; and Ramsey, Arthur Albert, 3,816,421.
Mayhew, Roger D., 3,815,701.
Nephew, Oliver T., 3,815,760.
Thorpe, Dean F., 3,816,474.

Foldcraft Company: *See*—
Nielsen, Harold R.; and Hagenson, Leo J., 3,816,044.

Folkenroth, Earl Earnest; and Ullman, Robert, to AMP Incorporated. Insulation stripper and wire separator for twisted wire pairs. 3,815,449, Cl. 81-9.510.

Folliot, John M.: *See*—
Steckler, Robert; Folliot, John M.; and Warren, Morris J., 3,816,354.

Fontaine, Roger Noel: *See*—
Haberer, Jean-Paul; and Fontaine, Roger Noel, 3,816,189.

Foral, Ralph F.: *See*—
Duvall, Paul F.; Humphrey, W. Donald; Timberlake, Thomas E.; and Foral, Ralph F., 3,815,773.

Forano Limitee, mesne: *See*—
Biloco, Georges; and Hooper, E. Peter J., 3,815,763.

Ford, Anthony R.: *See*—
Lunenschloss, Edward V.; and Ford, Anthony R., 3,816,681.

Ford, Harold E.: *See*—
Tomozawa, Atsushi; and Ford, Harold E., 3,816,666.

Ford Motor Company: *See*—
Martin, John A., 3,815,437.

Forkardt, Paul, Kommanditgesellschaft: *See*—
Steinberger, Josef; and Pohl, Heinz, 3,815,929.

Forster, Denis; and Morris, Donald E., to Monsanto Company. Production of carboxylic acids. 3,816,490, Cl. 260-413.000.

Fortune, William S. Soldering materials dispensing apparatus. 3,815,843, Cl. 242-96.000.

Foseco International Limited: *See*—
Eccleston, Kenneth Thomas; and Frizzell, John George, 3,815,210.
Eccleston, Kenneth Thomas; and Fieldhouse, Roger, 3,815,664.

Foster, Edson P. Felting needle. 3,815,186, Cl. 28-4.00n.

Foster, Jimmie L.: *See*—
Tribuno, Robert F.; and Foster, Jimmie L., 3,815,850.

Foulks, Noah E.; and Lowry, Earl. Pipe perforating machine. 3,815,399, Cl. 72-186.000.

Fox, Daniel W., 25% each to DePrima, Anthony E. and Aranda, Thomas, Jr. Dental hygiene assembly. 3,816,007, Cl. 401-146.000.

Fox, Joseph S.; Skiles, David O.; and Richardson, Calvin G., to Union Barbide Corporation. Process for recovery of vanadium values from ferrophosphorus and/or ferrophosphorus mixtures. 3,816,589, Cl. 423-68.000.

Fox, Richard W.: *See*—
Korn, Sebald R.; Fox, Richard W.; and Sahm, William H., III, 3,816,763.

Fraim, Freeman W.; and Murphy, Preston V., to Thermo Electron Corporation. Electret transducer cartridge and case. 3,816,671, Cl. 179-111.00e.

Fraioli, Ingrid: *See*—
Warbichler, Peter, 3,816,190.

Francis, Arthur W.: *See*—
Schreiner, Heinz R.; Hamilton, Robert W.; and Francis, Arthur W., 3,815,591.

Frank, Earl E., to Abex Corporation. Method and apparatus for improving car rollability in a railroad classification yard. 3,815,508, Cl. 104-26.00r.

Franklin Electric Co., Inc.: *See*—
Haifley, William E.; Kennerk, Robert D.; and Woods, Richard E., 3,815,898.

Franz, Raymond A., to Monsanto Company. Production of vinyl substituted aromatics from methyl substituted aromatics. 3,816,432, Cl. 260-290.000.

Franz, William F., to Hess, Howard V. and Cole, Edward L. Minimizing sulfur oxidation in pulping liquor reconstitution. 3,816,240, Cl. 162-31.000.

Frerichs, Peter: *See*—
Strobel, Roland; and Frerichs, Peter, 3,815,430.

Frey, Frederick W., Jr.; and Kobetz, Paul, to Ethyl Corporation. Method for the preparation of beryllium hydride from a dialkyl beryllium solution. 3,816,607, Cl. 423-645.000.

Frey, LaVerne L., to Bunker Ramo Corporation. Mounting for mechanical vibrator. 3,816,778, Cl. 310-25.000.

Freze, Benjamin H., to Challenge-Cook Bros., Incorporated. Continuous laundry dryer. 3,815,257, Cl. 34-129.000.

Frick, Douglas Gene: *See*—
Low, William Wayne; Frick, Douglas Gene; and Gancy, Alan Brian, 3,816,094.

Fridan Tool & Machine, Inc.: *See*—
Ames, Ward A., 3,815,803.

Fried, George; and Botero, Oscar, to Greiner Scientific Corporation. Multi-channel pump. 3,816,033, Cl. 417-429.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Aka, Peter, 3,815,804.
Wachendorf, Friedrich; and Wehling, Rolf, 3,815,348.

Friedman, Edward H.; and Heyman, Albert M., to Honeywell Information Systems, Inc. High current, regulated power supply with fault protection. 3,816,810, Cl. 321-19.000.

Friedman, Sam: *See*—
Crane, Jacob; Friedman, Sam; and Pryor, Michael J., 3,816,109.

Fritts, Rex E., to Amana Refrigeration, Inc. Safety interlock system for microwave ovens. 3,816,688, Cl. 219-100.550.

Frizzell, John George: *See*—
Eccleston, Kenneth Thomas; and Frizzell, John George, 3,815,210.

Fromknect, Charles Thomas; and Harbeck, Martin Edward, to Singer Company, The. Wet/dry suction cleaner. 3,815,172, Cl. 15-413.000.

Frost Engineering Development Corporation: *See*—
Frost, Richard H., 3,815,464.

Frost, Lynn Marie. Amusement device having interchangeable components. 3,815,282, Cl. 46-16.000.

Frost, Richard H., to Frost Engineering Development Corporation. Gas operated single stroke servo-motor. 3,815,464, Cl. 83-639.000.

Fuji Photo Film Co., Ltd.: *See*—
Hasegawa, Eiichi; and Tsuji, Nobuo, 3,816,140.
Sato, Masamichi; and Komaki, Takao, 3,815,545.
Shiba, Keisuke; Amano, Hiroyuki; Ueda, Hirozo; and Sato, Akira, 3,816,121.

Fujimoto, Takahiko: *See*—
Kagiya, Tsutomu; Mitsui, Hiroshi; Hosoi, Fumio; Fujimoto, Takahiko; Takata, Hiroshi; Tsuneta, Kazuyoshi; and Ushirokawa, Masahiro, 3,816,284.

Fujioka, George S.: *See*—
Brower, Frank M.; Daniels, Arthur L.; and Fujioka, George S., 3,816,192.

Fujita, Masaru: *See*—
Maki, Yoshiyuki; Fujita, Masaru; Takahashi, Hideo; and Ino, Tetsuo, 3,816,178.

Fukuda, Kaoru: *See*—
Morita, Yoshiharu; Kikumoto, Ryoji; Ohba, Hiroshi; Nakamura, Akio; Fukuda, Kaoru; and Nomura, Tatsuo, 3,816,465.

Fukura, Hiroshi: *See*—
Ohtsu, Yasuo; Nakatani, Seiji; and Fukura, Hiroshi, 3,815,192.

Fukushi, Saburo: *See*—
Usami, Seiji; Nishimura, Kotaro; and Fukushi, Saburo, 3,816,337.

Fukushima, Osamu; Sato, Masamichi; and Matsumoto, Seiji, said Fukushima and said Matsumoto assors. to Xerox Corporation. Electrophotographic method. 3,816,114, Cl. 96-11.0ly.

Fuller, George W., to King-Seely Thermos Co. Method of blow molding lines. 3,816,578, Cl. 264-98.000.

Fuller, Willard A.; Schulz, Arthur C.; and Rosen, Herbert J., to Hooker Chemical Corporation. Chlorine dioxide generating system. 3,816,077, Cl. 23-260.000.

Fulton, James C.: *See*—
Ramachandran, Sundaresan; Fulton, James C.; and Bishop, Harry L., Jr., 3,816,100.

Fumihiko, Morinaga: *See*—
Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; Naruke, Takeshi; Fumihiko, Morinaga; and Takeshi, Naruke, 3,816,629.

Furia, Thomas A.: *See*—
Dellian, Kurt A.; and Furia, Thomas A., 3,816,071.

Furuya, Akira: *See*—
Nakayama, Kiyoshi; Furuya, Akira; and Ukita, Masayo, 3,816,251.

Futurecraft Corporation: *See*—
Piet, Meyer, 3,815,286.

Gabrielsen, Rolf S.; and Olivares, Ismael A., to Eastman Kodak Company. Amino hydroxy cycloalkenone silver halide developing agents. 3,816,137, Cl. 96-76.000.

Gaither, Albert C., to Ridgeview Hosiery Mill Company. Panty hose. 3,815,156, Cl. 2-224.00r.

Gallagher, James P.; and Krenzke, Leonard D. Platinum-rhenium hydrocarbon conversion process. 3,816,300, Cl. 208-139.000.

Gallagher, Peter Christopher John; and Kotler, Gerald R., to N L Industries, Inc. Method for casting metal tennis racquet. 3,815,660, Cl. 164-112.000.

Gallay, Maurice. Inclinable jib for hoisting and transporting loads, in particular for cranes. 3,815,759, Cl. 212-8.00a.

Gan-Ed, Incorporated: *See*—
Ganskopp, William F.; and Edney, Carl, 3,815,699.

Gancy, Alan Brian: *See*—
Low, William Wayne; Frick, Douglas Gene; and Gancy, Alan Brian, 3,816,094.

Ganguly, Ashit K.: *See*—
Shapiro, Elliot L.; and Ganguly, Ashit K., 3,816,472.

Ganskopp, William F.; and Edney, Carl, to Gan-Ed, Incorporated. Portable motorized golf cart. 3,815,699, Cl. 180-11.000.

Ganz, Robert H., to Federal Paper Board Company, Inc. Wrapping machine. 3,815,320, Cl. 53-48.000.

Garcia, Paulina P.: *See*—
Borror, Alan L.; and Garcia, Paulina P., 3,816,123.

Gardella, Adriano. Clutch for a stretching mechanism in a spinning or twisting machine. 3,815,349, Cl. 57-83.000.

Gardella, Adriano. Process for the production of yarns. 3,815,350, Cl. 57-167.000.

Gardner, Gerald Marvin, to Image Analysing Computers Limited. Automated image analysis employing automatic focussing. 3,816,651, Cl. 178-7.200.

Gariboldi, Franco, to Billi, G. & C. S.p.A. Seamless tubular garment. 3,815,385, Cl. 66-172.00r.

Garrett Corporation, The: *See*—
Smialowicz, Edward H., 3,815,417.

Garrity, Paul G.: *See*—
Court, Patrick R., 3,816,058.

Gates Rubber Company, The: *See*—
Russ, Paul E., Sr.; McComber, Donald R.; and Patterson, Philip M., 3,815,960.

Gawron, Louis, Jr.: *See*—
Andrews, Stephen Stewart, Jr.; Gawron, Louis, Jr.; and Meidl, Gary John, 3,816,674.

Gaydos, George Roy, Jr. Solar heating system. 3,815,574, Cl. 126-271.000.

Gea Luftkuhlergesellschaft Happel GmbH & Co., KG: *See*—
Schulenberg, Heinrich; and Seien, Gunter, 3,815,203.

Gearhart, George E. Method of and means for improving the armhole construction of a garment. 3,815,154, Cl. 2-93.000.

Gearhart, Walter S., to Ametek, Inc. Hydrostatic altimeters and methods of use. 3,815,423, Cl. 73-432.0ha.

Gebrueder Buehler AG: *See*—
Keller, Alois, 3,815,741.

Geevert, Herbert; and Peter, Keith. Sound reproduction system. 3,816,672, Cl. 179-115.50r.

Geipel, Stanley W., to Metallo Gasket Co. Gasket structure and method of manufacture. 3,815,927, Cl. 277-180.000.

Gelfand, Samuel; Carr, Russell L. K.; and Baranauckas, Charles F., to Hooker Chemical Corporation. Fluoro-2-hydroxytetrahydropyrans. 3,816,468, Cl. 260-345.900.

General Battery Corporation: *See*—
Pavlo, William A.; and Conroy, Richard M., 3,815,659.

General Dynamics Corporation: *See*—
Snyder, H. Ben, 3,816,273.

General Electric Company: *See*—
Anderson, Harry Christer; and MacKenzie, Burton Thornley, Jr., 3,816,639.
Baldrige, John, Jr.; and Sobieski, John C., 3,816,054.
Borom, Marcus P.; and Burke, Joseph E., 3,816,704.
Ceremsak, Richard J.; and Hersey, Avon H., 3,816,086.
Day, William H., 3,816,022.
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Greer, David L., 3,816,725.
Habegger, Richard J., 3,815,207.
Hale, Thomas Eugene, 3,816,081.

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Koloch, Klaus E.; and Doe, Lester Adrian, Jr., 3,816,562.
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General Motors Corporation: *See—*
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DeLorean, John Z.; and Lindbert, Brook A., 3,815,703.
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Harrington, James A., 3,815,716.
Hussey, James L., 3,815,168.
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Jones, Trevor O., 3,815,935.
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Weststrate, Willem J. J., 3,815,934.

General Signal Corporation: *See—*
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General Time Corporation: *See—*
Lundin, Robert S., 3,816,779.

Genesi, Robert C.: *See—*
Anselmo, Robert A.; Oppenheimer, Michael H.; and Genesi, Robert C., 3,816,766.

Genson, Samuel Richard, to Johns-Manville Corporation. Apparatus for chopping strand. 3,815,461, Cl. 83-347.000.

Gerbasi, Dennis P.: *See—*
Donohue, James M.; and Gerbasi, Dennis P., 3,816,157.

Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 3,815,221.

Gerhart, Schneider: *See—*
Erdmann, Dietrich; Schuhrer, Klemens; Koch, Wolfgang; and Gerhart, Schneider, 3,816,464.

Germain, Roger Louis Elysee, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Double wobble plate compressors. 3,816,037, Cl. 418-53.000.

Gerner, Heinz, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg. Template controlled trueing device with an adjustable template follower. 3,815,568, Cl. 125-11.0tp.

Giannini, Richard J., to Hazeltine Corporation. Cylindrical array antenna. 3,816,830, Cl. 343-100.0sa.

Gibbons, John P.; and Wondolowski, Lawrence, to CPC International Inc. Alkyl glucoside reaction product. 3,816,395, Cl. 260-210.00r.

Gibbons, Loren K., to FMC Corporation. Isoxazolopyrimidine herbicides and method of controlling plant growth. 3,816,090, Cl. 71-92.000.

Gibbons, Loren Kenneth; and Ramsey, Arthur Albert, to FMC Corporation. 3,6-Dialkylisothiazolo[3,4-d]pyrimidin-4(5H)-ones. 3,816,420, Cl. 260-256.50r.

Gibbons, Loren Kenneth; and Ramsey, Arthur Albert, to FMC Corporation. Dihydroisazolopyrimidine herbicides. 3,816,421, Cl. 260-256.40f.

Gibeault, Robert E., to Kleenaire Recycling Systems, Inc. Incinerator. 3,815,523, Cl. 110-8.00c.

Gibilterra, Charles A., to Vecta Group, Inc., The. Chair construction. 3,815,955, Cl. 297-295.000.

Giesemann, Rolf: *See—*
Bauer, Adolf; Weber, Karl Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, 3,816,409.

Giesken, Kenneth Frank, to Bell Telephone Laboratories, Incorporated. Arrangement for providing switched range extension. 3,816,668, Cl. 179-18.0ea.

Giffel, Byron B.; and Cole, Robert B., to Belden Corporation. Low noise cord with non-metallic shield. 3,816,644, Cl. 174-115.000.

Gilbert, Henry S., to Bolton-Emerson, Inc. Novel disc refiner and method. 3,815,834, Cl. 241-28.000.

Gilfillan, Michael. Device in loop form having sides with relatively swivelable pivotable and slidable members. 3,815,280, Cl. 46-1.00r.

Gilfillan, William C.; and Spector, Saul R., to East Coast Equipment Corporation. Load body with load compacting and ejecting blade. 3,815,764, Cl. 214-82.000.

Gillessen, Dieter; Rudinger, Josef; and Studer, Rolf, to Hoffman-La Roche, Inc. [Ile^3, Leu^4] -Vesopressin analogs and intermediates. 3,816,385, Cl. 260-112.500.

Gilmont, Roger, to Gilmont, Roger, Instruments Inc. Micrometric dispenser with calibration means. 3,815,785, Cl. 222-46.000.

Gilmont, Roger, Instruments Inc.: *See—*
Gilmont, Roger, 3,815,785.

Ginaven, Marvin E., to Bauer Bros. Co., The. Thin waterfall separating ad screening apparatus. 3,815,740, Cl. 209-264.000.

Ginn, David W.: *See—*
Ott, Owen J.; and Ginn, David W., 3,816,799.

Girard, Rheal. Mold for casting test samples. 3,815,851, Cl. 249-121.000.

Girard, Robert R., to ACF Industries, Incorporated. . 3,815,516, Cl. Container lock.

Giroux, Davis W. Piling clamp. 3,815,373, Cl. 61-53.500.

Giustino, John. Tool for drilling a ledged hole. 3,815,694, Cl. 175-289.000.

Givaudan Corporation: *See—*
Bozzato, Giuliano; and Pesaro, Mario, 3,816,537.
Dubs, Paul; and Pesaro, Mario, 3,816,445.
Hug-Indebitzin, Marianne; Pesaro, Mario; and Schudel, Peter, 3,816,535.

Gladstone, Robert, to Olympus Optical Company Limited. Accelerometer. 3,815,427, Cl. 73-493.000.

Gladych, Jan Mieczyslaw Zygmunt; and Hussey, Clive Wilfred Theodore, to Allen & Hanburys Limited. Novel azetidinones and their use to inhibit lactamase enzymes that destroy β-lactam antibiotics. 3,816,408, Cl. 260-239.00a.

Glaros, Theodore J.; Hron, Roland L.; and Pribyl, George E., to Cir-Tech, Inc. Camera structure. 3,816,842, Cl. 354-171.000.

Glass, Marvin, & Associates: *See—*
Morrison, Howard J.; and Glass, Marvin I., 3,815,931.

Glass, Marvin I.: *See—*
Morrison, Howard J.; and Glass, Marvin I., 3,815,931.

Glassmeyer, John J., to Pullman Incorporated. Freight bracing apparatus for a freight container and method for assembling same. 3,815,500, Cl. 105-369.00a.

Glaverbel S.A.: *See—*
Plumat, Emile; and Tossaint, Francois, 3,816,222.

Glaxo Laboratories Limited: *See—*
Davis, Benjamin; and Phillipps, Gordon Hanley, 3,816,624.

Glick, Arthur, to American Cyanamid Company. Ethylene oxide sterilization of moisture sensitive surgical elements. 3,815,315, Cl. 53-21.0fc.

Globe-Union Inc.: *See—*
Buckethal, Paul J., 3,816,181.

Glukhovskoi, Boris Mikhailovich: *See—*
Vasiliev, Vladimir Pavlovich; Glukhovskoi, Boris Mikhailovich; Golubovsky, Oleg Mikhailovich; Kufal, Georgy Eduardovich; and Pliev, Leonid Filippovich, 3,815,977.

Gnusarev, Gennady Petrovich: *See—*
Voronin, Mjud Izrailevich; Gnusarev, Gennady Petrovich; Mekler, Abram Grigorievich; and Sosedov, Viktor Ivanovich, 3,815,509.

Go Luggage Corporation: *See—*
Guard, Edward J.; and Oliver, Robert F., 3,815,182.

Goduto, Thomas G. Golf swing analysis mat. 3,815,923, Cl. 273-186.00r.

Goettelman, William E. Pipe inhaler. 3,815,597, Cl. 128-196.000.

Goffe, Charles A.; Henn, Richard W.; and Swift, Paul F., to Eastman Kodak Company. Photographic element and process of developing. 3,816,136, Cl. 96-66.00r.

Gofke, Alfons, to Th. Kieserling & Albrecht. Cutting tool for peeling machines. 3,815,194, Cl. 29-96.000.

Goiffon, Thierry; Lehmann, Hans Rudolf; and Schaidl, Hubert, to Ateliers des Charmilles, S.A. Servo feed system for machine tool provided with locking mechanism. 3,815,470, Cl. 91-41.000.

Goldman, Maurice A., to United Merchants and Manufacturers, Inc. Cotton linter refining process and apparatus. 3,815,178, Cl. 19-205.000.

Goldstein, Mihai. Device for mass production garment steaming. 3,815,795, Cl. 223-70.000.

Goldstein, Steven A.: *See—*
Walters, John P.; Goldstein, Steven A.; and Eaton, William S., 3,815,995.

Goldstein, Theodore P., to Mobil Oil Corporation. Catalytic oxidation of carbonyl compounds. 3,816,522, Cl. 260-523.00a.

Golf Products, Inc.: *See—*
Turner, William M., 3,815,921.

Goller, Roman: *See—*
Biller, Efim; Goller, Roman; Schlegel, Richard; and Pflugk, Hellmuth, 3,816,547.

Golomb, David L., to Everlast World Boxing Headquarters Corporation. Baseball base. 3,815,905, Cl. 273-25.000.

Golubovsky, Oleg Mikhailovich: *See—*
Vasiliev, Vladimir Pavlovich; Glukhovskoi, Boris Mikhailovich; Golubovsky, Oleg Mikhailovich; Kufal, Georgy Eduardovich; and Pliev, Leonid Filippovich, 3,815,977.

Goodale, Paul E., to E-H Research Laboratories, Inc. Real-time multiplexed digital data recording system for telephone central office AMA recorders. 3,816,663, Cl. 179-7.0mm.

Gooding, Trevor Frank John; and Howse, Geoffrey David Stuart, to Electrosil Limited. Method of making an adjustable electrical component. 3,815,225, Cl. 29-613.000.

Goodwin, Charles M. Door lock push-button control structure. 3,816,752, Cl. 307-66.000.

Goodwin, Wayne M. Panel trailer. 3,815,768, Cl. 214-390.000.

Goodwin, William L.: *See—*
Cawley, Leo P.; Gurske, William A.; and Goodwin, William L., 3,816,045.

Goodyear Tire & Rubber Company, The: *See—*

Felten, Gilbert A., 3,816,218.
Okuzumi, Yozi, 3,816,377.
Stokes, James D., 3,816,202.

Googeboom, Thomas J., to General Electric Company. Branched aromatic polycarbonate composition. 3,816,373, Cl. 260-47.0xa.

Goosey, Benjamin F., to United States of America, Air Force. Method of fabricating boron suboxide articles. 3,816,586, Cl. 264-332.000.

Gordon, Bernard M., to Gordon Engineering Company. Charging a capacitor to represent sum and difference voltages. 3,816,803, Cl. 320-1.000.

Gordon Engineering Company: *See*—
Gordon, Bernard M., 3,816,803.

Gordon, Sherritt, Mines Limited: *See*—
Mackiw, Vladimir N.; Weir, Donald R.; Evans, David J. I.; and Maschmeyer, Dennis G., 3,816,098.

Gorrell, James M.; and Winzeler, James E., to Caterpillar Tractor Co. Variable speed planetary transmission. 3,815,445, Cl. 74-740.000.

Gorring, Robert L.: *See*—
Williams, Robert H.; Silverstri, Anthony J.; and Gorring, Robert L., 3,816,548.

Gosser, Lawrence Wayne, to Du Pont de Nemours, E. I., and Company. Selective concentration of gold, solver and copper in aqueous cyanide solutions. 3,816,587, Cl. 423-29.000.

Gotham, Robert W.; McKnight, Robert J.; and Neuwirth, Frank J. Roller having a sheet metal sleeve and inserted bearings. 3,815,196, Cl. 29-116.00r.

Gottlieb, Victor. Method of manufacturing moulded articles of wood particles with cover sheets. 3,816,208, Cl. 156-245.000.

Gotze, Johannes: *See*—
Kampfer, Helmut; Gotze, Johannes; Von Konig, Anita; and Ohlschlager, Hans, 3,816,131.

Goulart, Harold S., to United States of America, Navy. Precision non-translating mirror/lens mount. 3,815,429, Cl. 74-89.150.

Gould, Edson B., III., to Energy Sciences Incorporated. Electrical enhancement of pressure wave energy. 3,815,829, Cl. 239-102.000.

Goyer, Ronald Bruce, to RCA Corporation. Digital interface circuit for random noise generator. 3,816,765, Cl. 307-260.000.

Grabowsky, Otto: *See*—
Brunnmueller, Friedrich; Schatz, Hermann; Mayer, Johann; and Grabowsky, Otto, 3,816,376.

Graco, Inc.: *See*—
Schouteeten, Robert Andre Gustave; and Biais, Andre Julien Augoste Fernand, 3,816,028.

Graham, Cecil Robert Montgomery; and Little, Lambert Ronald, to Taylor, Samuel, Pty., Limited. Spring means. 3,815,886, Cl. 267-180.000.

Granberg, Elof. Hedge trimmer attachment for a chain saw. 3,815,229, Cl. 30-388.000.

Granite Mill & Fixture Co.: *See*—
Lyman, Hugh M., Jr., 3,815,966.

Grannen, Edward; and Robinson, Leon, to Occidental Petroleum Corporation. Melamine base polymeric sequestering agent and process. 3,816,356, Cl. 260-2.20c.

Granquist, William T.: *See*—
Hoffman, George W.; and Granquist, William T., 3,816,343.

Grayson, Martin: *See*—
Fine, Leonard Wolfe; Grayson, Martin; and Grayson, Suggs, 3,816,324.

Grayson, Suggs: *See*—
Fine, Leonard Wolfe; Grayson, Martin; and Grayson, Suggs, 3,816,324.

Greci, John J.: *See*—
Bascom, Hollis H.; Greci, John J.; and Hoopengardner, Merle R., 3,816,203.

Green, David T.; and Bryan, Graham W., to United States Surgical Corporation. Gas powered driving unit for surgical instrument. 3,815,476, Cl. 91-410.000.

Green, Robert E. Electronic isothermal device. 3,816,702, Cl. 219-413.000.

Greenberg, Abraham: *See*—
Loureiro, Valentin R.; and Greenberg, Abraham, 3,816,352.

Greenberg, Bessie R. Rotary pinking shear device. 3,815,231, Cl. 30-228.000.

Greenberg, Melvin, to United States of America, Navy. Method and formulations for producing diffuse infrared reflection coating. 3,816,271, Cl. 204-51.000.

Greene, Jerrold W.: *See*—
Hoke, Kenneth E.; Cunningham, George R.; and Greene, Jerrold W., 3,815,762.

Greene Line Manufacturing Corporation: *See*—
Hoke, Kenneth E.; Cunningham, George R.; and Greene, Jerrold W., 3,815,762.

Greenwood, Roger; and Van Bellen, Leo William, to International Telephone and Telegraph Corporation. Fluid flow control manifolds and devices. 3,815,633, Cl. 137-625.270.

Greer, David L., to General Electric Company. Multiple level associative logic circuits. 3,816,725, Cl. 235-152.000.

Greiner Scientific Corporation: *See*—
Fried, George; and Botero, Oscar, 3,816,033.

Griebsch, Eugen: *See*—
Burba, Christian; and Griebsch, Eugen, 3,816,511.

Grierson, David W., to Rohr Corporation. Electrical grounding device for tracked air cushion vehicles. 3,816,675, Cl. 191-49.000.

Griesbaum, Karl; Oswald, Alexis A.; and Hall, Daniel Noyes, to Esso Research and Engineering Company. Insecticidal, maticidal and nemitocidal use of unsymmertical thio-dithiophosphoric acid adducts. 3,816,623, Cl. 424-215.000.

Griffin, Thomas J.; and Dollarhide, Francis E., to Dow Chemical Company, The. Corrosion inhibitor. 3,816,322, Cl. 252-147.000.

Griffith, John Q., III: *See*—
Coppoch, Walter J.; Amaroso, James R.; and Griffith, John Q., III, 3,816,346.

Griffith, John Q., III; Williams, Edward S.; and Reiland, William H., Jr., to Sun Oil Company of Pennsylvania. Soap thickened hydraulic oil composition. 3,816,316, Cl. 252-72.000.

Grimm, John G., Jr.: *See*—
Sweet, Harold J.; Papworth, Robert L.; and Grimm, John G., Jr., 3,815,738.

Grinstead, Robert R., to Dow Chemical Company, The. Extraction of carboxylic acids from dilute aqueous solutions. 3,816,524, Cl. 260-527.00r.

Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., to Richardson-Merrell Inc. Lactamimide derivatives. 3,816,457, Cl. 260-329.0am.

Groves, Harvey H. Vaginal medicator. 3,815,600, Cl. 128-271.000.

Grubben, Henri Peter Johannes: *See*—
Limburg, Jan Hendrik Harmanus; and Grubben, Henri Peter Johannes, 3,816,667.

Grung, Geir; Skogen, Ole Jan; and Hoydahl, Per, to Sun House A/S. Frame construction assmebly including module elements for erecting builds in sections. 3,815,305, Cl. 52-264.000.

GTE Automatic Electric Laboratories, Incorporated: *See*—
Kuster, Karl H., 3,816,809.
Marshall, Richard A., 3,816,670.
Shaver, David M.; and Russell, Delbert A., 3,816,662.

GTE Sylvania Incorporated: *See*—
Radloff, Harry John; and Waybright, George Cleveland, 3,816,793.

Guala, Piergiacomo, to Societa' Angelo Guala di Piergiacomo e Roberto Guala & C.S.A.S. Closure device with a breakable seal for bottles or like containers. 3,815,770, Cl. 215-253.000.

Gualdi, Giorgio: *See*—
Reni, Cesare; Lugo, Luigi; and Gualdi, Giorgio, 3,816,554.

Guard, Edward J.; and Oliver, Robert F., to Go Luggage Corporation. Knock down luggage hand-manipulated fastener utilizing lock button. 3,815,182, Cl. 24-208.00a.

Gueldenpfenning, Klaus: *See*—
Russell, Stanley L.; Gueldenpfenning, Klaus; and Pommerening, Uwe A., 3,816,665.

Guerrant, Edmonds L. Hand splint for implant surgery. 3,815,587, Cl. 128-77.000.

Gugliotta, George; and Bradt, David M., to Laser Sciences, Inc. Apparatus for inspecting hardware items. 3,816,746, Cl. 250-223.00r.

Guild Metal Joining Equipment Company: *See*—
Wheeler, Donald J.; and Lohrenz, Victor, 3,816,696.

Gulf Oil Canada Limited: *See*—
Schutte, Robert, 3,816,305.

Gulf Research & Development Company: *See*—
Kobylinski, Tadeusz P.; and Taylor, Brian W., 3,816,594.

Gullichsen, Johan E.; and Ekholm, Rolf G., to Kamyr Aktiebolag. Device for bleaching of cellulosic pulp. 3,815,386, Cl. 68-181.00r.

Gundlach, Robert W., to Vencraft Corporation. Shadowless sun dial. 3,815,249, Cl. 33-269.000.

Gundlach, Robert W.; and Bean, Lloyd F., to Xerox Corporation. Method for forming a plurality of electrostatic latent images on an electrophotographic plate. 3,816,115, Cl. 96-1.400.

Gunther, Rush B.: *See*—
Bowen, John C.; and Gunther, Rush B., 3,816,029.

Gurevich, Rem Iosifovich: *See*—
Uvarov, Jury Petrovich; and Gurevich, Rem Iosifovich, 3,815,739.

Gurske, William A.: *See*—
Cawley, Leo P.; Gurske, William A.; and Goodwin, William L., 3,816,045.

Gustavii, Klas Ragnar: *See*—
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Lamm, Bo Robert, 3,816,533.

Gutehoffnungshuette Sterkrade A.G.: *See*—
Meier, Fran; Ossendorf, Erich; and Wolfgarten, Hubert, 3,815,339.

Guth, Carl R. Fuel mixing chamber for heating torches. 3,816,061, Cl. 431-352.000.

Guthrie, Robert M., to Fastener Engineers, Inc. Method and apparatus for controlling pay-off of wire from a coil to a wire processing machine. 3,815,837, Cl. 242-54.00r.

Guyer, Elbert J. Cooker. 3,815,491, Cl. 99-468.000.

Gyrosystems, Inc.: *See*—
Howe, Edwin W., 3,815,428.

Haas, Howard C.: *See*—
Demember, John R.; Haas, Howard C.; and Reid, Jerome L., 3,816,125.

Haas, Howard C., to Polaroid Corporation. Novel imaging systems containing optically active polysulfoxide groups. 3,816,127, Cl. 96-29.00r.

Haas, Werner E. L.; Flannery, John B., Jr.; Mechlowitz, Bela; and Adams, James E., to Xerox Corporation. Nematic liquid crystalline compositions having extended mesomorphic range. 3,816,113, Cl. 96-1.000.

Habegger, Richard J., to General Electric Company. Means for aligning coil injection tooling with a stator core. 3,815,207, Cl. 29-205.00r.

Haberer, Jean-Paul; and Fontaine, Roger Noel, to Societe d'Etudes et de Recherches Magnetiques. Solid-state diffusion process for the manufacture of permanent magnet alloys of transition elements and metals of the rare-earth group. 3,816,189, Cl. 148-101.00.

Haeck, Hans Heinz; and Pereboom, Willem Jan, to U.S. Philips Corporation. Halogenated salicoins having antiparasitic activities. 3,816,538, Cl. 260-590.000.

Hagen, Kenneth G.: *See*—
Huffman, Fred N.; and Hagen, Kenneth G., 3,815,363.

Hagenson, Leo J.: *See*—
Nielsen, Harold R.; and Hagenson, Leo J., 3,816,044.

Haifley, William E.; Kennerk, Robert D.; and Woods, Richard E., to Franklin Electric Co., Inc. Label handling mechanism. 3,815,898, Cl. 271-65.000.

Haigh, Thomas I., to Penn Novelty Company, The, mesne. Embroidered emblem and method for making the same. 3,816,211, Cl. 156-309.000.

Hale, Thomas Eugene, to General Electric Company. Abrasion resistant cemented tungsten carbide bonded with Fe-C-Ni-Co. 3,816,081, Cl. 29-182.700.

Hall, Daniel Noyes: *See*—
Griesbaum, Karl; Oswald, Alexis A.; and Hall, Daniel Noyes, 3,816,623.

Hall, Howard T., to Megadiamond Corporation. Diamond-non-diamond carbon polycrystalline composites. 3,816,085, Cl. 51-307.000.

Hall, Hugh E., Jr.: *See*—
Richter, Albert P., Jr.; Bruner, James D.; Mazzagarri, Roy P.; and Hall, Hugh E., Jr., 3,815,691.

Hall, John B., to International Flavors & Fragrances, Inc. Perfume compositions containing a alkyl cyclododeca-detone. 3,816,349, Cl. 252-522.000.

Hall, John B., to International Flavors & Fragrances, Inc. Perfume composition containing indanone derivatives. 3,816,350, Cl. 252-522.000.

Hall, John C.; and Tribuno, Robert F., to Collins Radio Company. Synthesis of fail operational heading information (course datum) from nonfail operational input signals. 3,816,718, Cl. 235-150.260.

Hall, Raymond L. Method and apparatus for ready installation and reinstallation of a flexible liner for swimming pools. 3,815,162, Cl. 4-172.210.

Hamano, Tatsuji. Filter for removing such particles and miscellaneous dirt as contained in a fluid. 3,815,341, Cl. 55-477.000.

Hamb, Frederick L., to Eastman Kodak Company. Film element comprising aromatic diester containing copolyester support. 3,816,122, Cl. 96-87.00r.

Hamilton, Robert W.: *See*—
Schreiner, Heinz R.; Hamilton, Robert W.; and Francis, Arthur W., 3,815,591.

Hamlin, Robert. Spray can adapter. 3,815,819, Cl. 239-11.000.

Hamlyn, Maxwell Charles; Kidney, Allan James; and Owen, Alexander, to Lever Brothers Company. Preparation of a tubular collagent casing. 3,816,632, Cl. 99-176.000.

Hamma, Gerhard, to Maschinenfabrik Speichingen GmbH. Control mechanism for circular knitting machine with rotating needle carrier. 3,815,383, Cl. 66-50.00r.

Hamma, John: *See*—
Rapoza, Edward J.; Siegel, Maxwell E.; Estelle, Weems E.; Petrucci, Pasquale M.; Linarducci, Joseph S.; Hamma, John; and Montgomery, John, 3,815,769.

Hammer, Glen P., to Esso Research and Engineering Company. Process for producing a gaseous composition containing hydrogen or hydrogen and carbon oxides. 3,816,609, Cl. 423-652.000.

Hammer, James A.: *See*—
Neckermann, Edwin F.; and Hammer, James A., 3,816,577.

Hampton, Anthony Everette: *See*—
Moore, James Melvin; Newell, William Gilbert; Hampton, Anthony Everette; and Jackson, Philip Elmo, 3,815,179.

Hanka, Ladislav J.: *See*—
Bergy, Malcolm E.; Hanka, Ladislav J.; Herr, Ross R.; and Mason, DonaldJ., 3,816,619.

Hanold, R. C. Frederick, III, to Union Carbide Corporation. Process for making ceramic capacitors. 3,815,187, Cl. 29-25.420.

Hansel, William B., to Sun Oil Company of Pennsylvania. Dispensing nozzle arrangement providing electrical lockout. 3,815,784, Cl. 222-26.000.

Hansen, Clarence C. Houseboat powered by smaller boat. 3,815,541, Cl. 114-235.00r.

Hansford, Rowland C., to Union Oil Company of California. Exhaust gas conversion process and catalyst. 3,816,401, Cl. 423-213.500.

Haoya, Einar; Presthus, Martin; and Christiansen, Hans, to Mandals Reberbane Christiansen & Co. A/S. Shed forming device in weave looms. 3,815,643, Cl. 139-15.000.

Happe & Co., Firma: *See*—
Haussels, Berthold, 3,815,173.

Hara, Hideki: *See*—
Shimizu, Shozo; Iwase, Tetsumi; Hara, Hideki; Hori, Ryozo; and Sakurai, Shigenori, 3,816,344.

Harbeck, Martin Edward: *See*—
Fromknect, Charles Thomas; and Harbeck, Martin Edward, 3,815,172.

Hard, Robert Amos: *See*—
Bauer, Edwin Francis; Dokken, Roger Nels; Hard, Robert Amos; and Malhota, Umesh Kumar, 3,816,720.

Hardenbrook, James M.: *See*—
Russell, Jack A.; Walker, Jerome F.; and Hardenbrook, James M., 3,815,909.

Harland, Philip W.; and Waite, Ralph D., to Ametek, Inc. Gauge with cemented bourdon. 3,815,421, Cl. 73-418.000.

Harmon, F. L. Sentinel mail signal. 3,815,811, Cl. 232-35.000.

Harrington, James A., to General Motors Corporation. Automatic piston adjuster. 3,815,716, Cl. 192-111.00a.

Harris-Intertype Corporation: *See*—
Dufour, Charles H., 3,815,895.

Harrison, Daniel A. Crab lure and trap. 3,815,276, Cl. 43-43.100.

Harrison, Stanley, to Alpha Industries, Inc., mesne and Ion accelerator employing crossed-field selector. . 3,816,748, Cl. 250-296.000.

Harrod, Jimmie A., to Moore Business Forms, Inc. Oscillating roll for printing presses. 3,815,498, Cl. 101-348.000.

Hartman, Carl C. Semi-automatic packing of packages. 3,815,321, Cl. 53-61.000.

Hartridge, Leslie, Limited: *See*—
Emerson, Reginald Stanley, 3,815,411.

Hartwig, Walter J., to Allis-Chalmers Corporation. Replaceable tip for end stripper of traveling grate conveyor and end stripper having such replaceable tip. 3,815,727, Cl. 198-230.000.

Hartwimmer, Robert, to Farbwerke Hoeschst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the preparation of perfluorinated compounds. 3,816,552, Cl. 260-648.00f.

Hasegawa, Eiichi; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Light-sensitive composition containing ketone-formaldehyde resin. 3,816,140, Cl. 96-115.00r.

Hashimoto, Osamu; and Takabayashi, Yoshikazu, to Nippon Gukki Seizo Kabushiki Kaisha and Laminated ski having cellular plastic core and method for producing the same. . 3,816,573, Cl. 264-45.000.

Hashimoto, Yoshio. Bowler's wrist support. 3,815,908, Cl. 273-54.00b.

Hass, Robert H.; Reeg, Cloyd P.; and Attane, Edward C., Jr., to Union Oil Company of California. Hydrocracking process. 3,816,296, Cl. 208-111.000.

Hass, Robert W. Overhead garage door latch. 3,815,943, Cl. 292-254.000.

Hasselbach, Wolfgang, to Braun AG. Sound reproducing apparatus. 3,815,924, Cl. 274-23.00r.

Haszeldine, Robert Neville; and Tipping, Anthony Edgar. Preparation of fluoroalkane sulphides. 3,816,277, Cl. 204-158.00r.

Haszeldine, Robert Neville; and Rowland, Ronald. Process for insertion of hexafluoropropene at the aliphatic carbon-hydrogen bond of a hydrocarbon or substituted hydrocarbon or substituted hydrocarbon. 3,816,286, Cl. 204-163.00r.

Hata, Kazuhiko: *See*—
Yagi, Yoshiharu; Sato, Hiroshi; Narisawa, Shizuo; Yasui, Seimei; Kogayashi, Akiro; Hino, Minoru; and Hata, Kazuhiko, 3,816,567.

Hatzmann, John F., to Xerox Corporation. Sheet delivery device. 3,815,899, Cl. 271-80.000.

Haubein, Albert H., to Hercules Incorporated. Use of O,O-di-(C_1-C_3alkyl)S-[1-(C_2-C_{20}acyl) hydantoin-3-yl] methyl phosphorothioates as insecticides. 3,816,621, Cl. 424-200.000.

Haugwitz, Rudiger D.: *See*—
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger D., 3,816,444.

Haugwitz, Rudiger Dieter: *See*—
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger Dieter, 3,816,414.

Hauni-Werke Koerber & Co. KG: *See*—
Bardenhagen, Dietrich, 3,815,460.

Hauser, Raimund: *See*—
Morell, Josef; Nowak, Johann; Schild, Josef; and Wessner, Harald, 3,815,847.

Haussels, Berthold, to Happe & Co., Firma. Caster for pieces of furniture and the like. 3,815,173, Cl. 16-45.000.

Haussuehl, Siegfried. Method for obtaining a harmonic frequency using a potassium bromate nonlinear optical component. 3,815,973, Cl. 350-160.00r.

Haven, William D.; and Miller, Sol, to Du Pont de Nemours, E. I., and Company. Method of protecting colloidal silica aquasols from bacterial degration. 3,816,330, Cl. 252-313.00s.

Hawkins Mfg., Inc.: *See*—
Hawkins, Roy I., 3,815,528.

Hawkins, Roy I., to Hawkins Mfg., Inc. Agricultural dry chemical underground applicator tool combination. 3,815,528, Cl. 111-85.000.

Haws, Melburn W., to Armour and Company. Method and apparatus for removing hides from animal carcasses. 3,815,177, Cl. 17-50.000.

Hayakawa, Fumio: *See*—
Yamamoto, Mititaka; and Hayakawa, Fumio, 3,816,730.

Hayase, Yoshio: *See*—
Nagata, Wataru; and Hayase, Yoshio, 3,816,570.

Hayashi, Katsumi: *See*—
Miller, Leonard Edward; and Hayashi, Katsumi, 3,816,370.

Hayashi, Masaki; and Ishihara, Atsunobu, to Ono Pharmaceutical Co., Ltd. Clathrate compounds of prostaglandins or their analogues with cyclodexrin. 3,816,393, Cl. 260-209.00r.

Hayner, Don S.: *See*—
Derdowski, Ronald A.; Hayner, Don S.; and Parker, Frank S., 3,816,697.

Hazeltine Corporation: *See*—

Giannini, Richard J., 3,816,830.

Heap, James C., to Thrall Car Manufacturing Company. Rapid discharging hopper car door actuating mechanism. 3,815,514, Cl. 105-240.000.

Heaton, Joe. Simulated vehicle. 3,815,260, Cl. 35-11.000.

Hebenstreit, Ernst, to Siemens Aktiengesellschaft. Method of making conductor plate with crossover. 3,816,195, Cl. 156-3.000.

Heck, Friedrich, to Duria-Werk Karl Kempf KG. Method of coating steel plates with sintered friction layers. 3,816,112, Cl. 75-208.00r.

Heckert, Bruce J.: *See—*
Burge, Harland L.; and Rodewald, Newell C., 3,815,356.

Hedlund, Marc Theodore; and White, Wilfrid Francis, to Abbott Laboratories. Purification process for Gn-RH. 3,816,386, Cl. 260-112.500.

Heffelfinger, John F. Foldable and portable grill. 3,815,571, Cl. 126-9.00r.

Hegenscheidt, Wilhelm, Kommanditgesellschaft: *See—*
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Heider, Joachim: *See—*
Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; and Diederen, Willie, 3,816,403.

Heigne, Leopold: *See—*
Lotgering, Frederik Karel; Beekmans, Nicolaas Marinus; Van Der Steen, Gerardus Henricus Antonius Maria; and Heigne, Leopold, 3,816,179.

Hein, John W. Dental instruction device. 3,815,244, Cl. 32-71.000.

Heintz, Ralph M., Sr.: *See—*
O'Malley, Conor C.; and Heintz, Ralph M., Sr., 3,815,604.

Heisler, Raymond A. Apparatus and method for automatically sizing and wrapping a shrink wrap envelope around advancing luggage. 3,815,313, Cl. 53-14.000.

Heitner, Alfred, to Klaus Esser KG. Electrically heated water outlets. 3,816,687, Cl. 219-100.490.

Heitz, Ronald George: *See—*
Duncan, William Lankford; and Heitz, Ronald George, 3,816,001.

Held, Paul, to Allstate Tool and Die Inc. Sanding machine for bowling alleys. 3,815,291, Cl. 51-170.0pt.

Hell, Rudolf, Dr. Ing., GmbH: *See—*
Baar, Walter, 3,815,217.
Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, 3,816,698.
Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, 3,816,699.

Heller, William C., Jr.: *See—*
Heller, William C., Jr.; and Leatherman, Alfred F. (said Leatherman assor. to said), 3,816,574.

Heller, William C., Jr.; and Leatherman, Alfred F., said Leatherman assor. to said Heller, William C., Jr. Method of foaming plastics using an alternating magnetic field. 3,816,574, Cl. 264-45.000.

Hellstrom, Karl Bertil. Method of increasing the measuring resolution of a flow measuring instrument where the flow is divided into sections of well defined volume. 3,815,414, Cl. 73-194.00e.

Helmut, Spork: *See—*
Nitzsche, Siegfried; Strasser, Rudolf; Leser, Robert; and Helmut, Spork, 3,816,493.

Hendrick, Fred W., to Robertshaw Controls Company. Valve assembly. 3,815,873, Cl. 251-337.000.

Henkel & Cie GmbH: *See—*
Schmadel, Edmund, 3,816,378.
Werdehausen, Achim; Weiss, Herbert; and Schutt, Hartwig, 3,816,483.

Henn, Richard W.: *See—*
Goffe, Charles A.; Henn, Richard W.; and Swift, Paul F., 3,816,136.

Henrick, Clive A., to Zoecon Corporation. Aliphatic hydrocarbon 2,4-dienamides. 3,816,484, Cl. 260-404.000.

Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Cyclopropanemethylthiol diester of terephthalic acid. 3,816,501, Cl. 260-455.00r.

Henry, Mort W., to Borodin, Daniel J. and New York Wire Mills Corporation. Hinge for hinged stirrup fabric. 3,815,642, Cl. 138-175.000.

Hensel, Willi: *See—*
Bocksch, Karl; and Hensel, Willi, 3,815,956.

Hentschel, Gerhard Oskar, 1/2 interest to Hentschel, Walter S. E. Detergent. 3,816,318, Cl. 252-89.000.

Hentschel, Walter S. E.: *See—*
Hentschel, Gerhard Oskar, 3,816,318.

Herbruggen, Henry J.: *See—*
Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., 3,815,662.

Hercules Incorporated: *See—*
Curtis, William R.; and Trimble, David C., 3,815,887.
Haubein, Albert H., 3,816,621.
Podlas, Thomas J., 3,816,151.
Younkin, Harry A., 3,815,358.

Herman Engineering Corporation: *See—*
Sweet, Harold J.; Papworth, Robert L.; and Grimm, John G., Jr., 3,815,738.

Hermo, Lawrence E. Batting practice trainer. 3,815,906, Cl. 273-26.00r.

Hernandez, Ernest S.: *See—*
Krag, Niels; Hernandez, Ernest S.; and Horvath, Kalman, 3,816,205.

Hernestam, Sven Erik Harry; Sterner, Nils Olov Bruno; and Lassen, Jorgen Buus, to AB Ferrosan. 4-Fluoro-γ-(4-methyl-piperidino) butyrophenone and its pharmaceutically acceptable salts. 3,816,433, Cl. 260-293.800.

Herr, Ross R.: *See—*
Bergy, Malcolm E.; Hanka, Ladislav J.; Herr, Ross R.; and Mason, Donald J., 3,816,619.

Herrin, Richard: *See—*
Isaacson, Louis; and Herrin, Richard, 3,816,026.

Hersey, Avon H.: *See—*
Ceremsak, Richard J.; and Hersey, Avon H., 3,816,086.

Hershman, Arnold: *See—*
Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., 3,816,488.
Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., 3,816,489.

Herzog, Klaus, to Zeiss-Stiftung, Carl d/b/a Carl Zeiss. Method and apparatus for detecting relative deviations in position of two parts moved in a predetermined desired relationship. 3,816,712, Cl. 235-92.0mp.

Hess, Howard V.: *See—*
Franz, William F., 3,816,240.

Heyman, Albert M.: *See—*
Friedman, Edward H.; and Heyman, Albert M., 3,816,810.

Hicguet, Max, to Societe d'Etudes et de Recherches Schentifiques et Minieres. Process for heating industrial furnaces. 3,816,063, Cl. 432-19.000.

Hickey, Christopher Daniel Dowling. Protection of aircraft. 3,815,650, Cl. 150-52.00r.

Hideo, Suyama: *See—*
Ohnuki, Katuhiro; Sato, Kazuhiro; Miyajima, Shin; and Hideo, Suyama, 3,816,774.

Higaki, Taiji; and Mikumo, Masao, to Kanzaki Paper Manufacturing Co., Ltd. Method of making recordings in a recording sheet material. 3,816,838, Cl. 346-1.000.

Higo, Kyoichi: *See—*
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Hildreth, Clarence L., to Ethyl Corporation. Halogenating method of reducing iron and titanium content of alumina-silica ore. 3,816,093, Cl. 75-1.000.

Hill, Menno E. Industrial roller or wheel. 3,815,959, Cl. 301-63.0pw.

Hills McCanna Company: *See—*
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Hino, Minoru: *See—*
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Hiraiwa, Kazuyoshi, to Nissan Motor Company, Limited. Friction clutch. 3,815,714, Cl. 192-70.250.

Hirata, Michiaki, to Tokyo Toyo Rubber Industry Co., Ltd. Gas filling apparatus for inflatable floats. 3,815,783, Cl. 222-5.000.

Hirsch, Allen Frederick, to Ortho Pharmaceutical Corporation. O-aryl oximes of 3-keto steroids. 3,816,406, Cl. 260-239.500.

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Hodgson, Donald W. Fifth wheel having a universal king pin locking mechanism. 3,815,937, Cl. 280-434.000.

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Hodgson, Rodney T.; Lankard, John R.; Sorokin, Peter P.; and Wynne, James J., to International Business Machines Corporation. Tunable infrared/ultraviolet laser. 3,816,754, Cl. 307-88.300.

Hoefke, Wolfgang: *See—*
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Hoehl, Bernhard; and Rapparlie, Hans, to Licentia Patent-Verwaltungs-G.m.b.H. Arrangement for the controlled discharge of individual flat items. 3,815,897, Cl. 271-9.000.

Hoelscher, William R., to Elevator Corporation. Vane local control system for elevators. 3,815,711, Cl. 187-29.00r.

Hoenisch, Walter Harold, to King-Seeley Thermos Co. Refrigeration fan control system. 3,815,378, Cl. 62-184.000.

Hofer, Kurt; and Moesch, Rudolf, to Sandoz Ltd. N,N-diaryloxamides containing phosphorus. 3,816,568, Cl. 260-944.000.

Hoffman, Douglas L. Gem grinder having a pivotable rack and gear assembly. 3,815,289, Cl. 51-125.500.

Hoffman, George W.; and Granquist, William T., to NL Industries, Inc. Kalonite coated with synthesized layer-type silicate minerals. 3,816,343, Cl. 252-455.00r.

Hoffman, John E.; and Schelich, Ardell J., to Sporlan Valve Company. Refrigerant filter-drier. 3,815,752, Cl. 210-266.000.

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Hoffman, Joseph Adrian: *See*—
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Hoffman, Lewis Charles. Nonreducible partially crystallized crossover dielectrics. 3,816,172, Cl. 117-212.000.

Hoffman, Udo; and Eiben, Siegfried, to Siemens Aktiengesellschaft. Device for changing indicia into electrical signals. 3,816,710, Cl. 235-61.11c.

Hoffman-La Roche, Inc.: *See*—
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Hoke, Kenneth E.; Cunningham, George R.; and Greene, Jerrold W., to Greene Line Manufacturing Corporation. Automatic sheet feeder. 3,815,762, Cl. 214-8.50a.

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Holliday, Harvey Ray; and Schurter, Gary Lee, to International Telephone and Telegraph Corporation. Insulation coating compositions. 3,816,564, Cl. 260-878.00r.

Holm, Kunt Anders, to Uddeholms Aktiebolag. Degreasing apparatus and method. 3,815,615, Cl. 134-79.000.

Holma, Johan Edvin, to Sandvik Aktiebolag. Chip-forming cutting tool. 3,815,191, Cl. 29-95.00r.

Holt, James G., Jr., to Fairchild Camera and Instrument Corporation. Noise suppression circuit. 3,816,762, Cl. 307-237.000.

Honda, Shigemichi; and Ito, Norio, to Sony Corporation. Automatic stylus extending mechanism. 3,816,839, Cl. 346-74.0es.

Hondermark, Jean Claude, to British Petroleum Company Limited, The. Apparatus for the recovery of micro-organisms cultivated on a hydrocarbon substrate. 3,815,331, Cl. 55-178.000.

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Horton, Robert F.; and Madachy, John F., to Loopco Industries, Inc. Expansible mandrel assembly and method. 3,815,840, Cl. 242-72.000.

Horvath, Kalman: *See*—
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Houghton, Norman F., to Philco-Ford Corporation. Apparatus for forming articles from plastic sheet material. 3,816,051, Cl. 425-388.000.

Houlihan, William J., to Sandoz-Wander, Inc. Thieno (2,3-g) indazoles. 3,816,437, Cl. 260-294.80b.

Houlihan, William J., to Sandoz-Wander, Inc. 2H[1]-Benzothiepino[5,4-c]pyrazoles and [1]-benzothiopyrano[4,3-c]pyrazoles. 3,816,438, Cl. 260-294.80b.

House, John I. Control for rearview mirror. 3,815,365, Cl. 60-572.000.

Howard, Frank C.; and Wilson, Steven J., to Signode Corporation. Fastener driving tool with improved piston return. 3,815,475, Cl. 91-399.000.

Howe, Edwin W., to Gyrosystems, Inc. Gyrocompasses. 3,815,428, Cl. 74-5.400.

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Huck, Rodney M., to Monsanto Company. Filled aldehyde condensates having improved heat resistance. 3,816,558, Cl. 260-838.000.

Huffman, Fred N.; and Hagen, Kenneth G., to Thermo Electron Corporation. Multiple cycle tidal regenerator engine. 3,815,363, Cl. 60-531.000.

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Hughes Aircraft Company: *See*—
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Hughes, Benjamin F. Hughes rotary internal combustion engine. 3,815,554, Cl. 123-8.090.

Huizing, Albert; and Schroder, Johann, to U.S. Philips Corporation. Method of manufacturing metal fluorides and metal fluoride mixtures which do not comprise oxygen. 3,816,600, Cl. 423-489.000.

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Hunt, Heman Dowd, to Du Pont de Nemours, E. I., and Company. Direct positive silver halide emulsions through synergistic effects of fogging agents and organic reducing agents and/or their oxidized forms. 3,816,135, Cl. 96-64.000.

Hunt, Mack W., to Continental Oil Company. Method for preparing highly basic grease and rust inhibiting compositions. 3,816,310, Cl. 252-32.7hc.

Hurlbut, Russell G.; Lindsay Donald J.; and Sproul, John C., to Eastman Kodak Company. Slide mounting machine. 3,816,219, Cl. 156-443.000.
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Huska, Paul A.; and Meissner, Herman P., to Little, Arthur D., Inc. Method and apparatus for providing a pure concentrated aqueous solution of aluminum nitrate. 3,816,590, Cl. 423-112.000.
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Huszty, Denes; and Szabados, Karoly, to Elektroakusztikai Gyar. Tone control utilizing an operational amplifier with differential inputs. 3,816,661, Cl. 179-1.00d.
Hutchins, Alma A. Structure and manufacture of abrading tool having suction system. 3,815,292, Cl. 51-170.0mt.
Huyffer, Paul S., to Polaroid Corporation. Photographic processes and products employing mixed indole/carbazole phthaleins as optical filter agents. 3,816,120, Cl. 96-3.000.
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Ichiki, Minoru; and Nakade, Kazuhiko, to Mitsui Mining & Smelting Co., Ltd. Method for the treatment of water. 3,816,276, Cl. 204-152.000.
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Izumi, Kenkichi; and Tamura, Zensuke, to Hitachi, Ltd. Process and apparatus for making highly pure water. 3,816,266, Cl. 203-11.000.
Jackson, George Wilburt: *See—*
Seger, Paul Robert, 3,815,434.
Jackson, Leland B., to Rockland Systems Corporation. Apparatus and method for serial-parallel binary multiplication. 3,816,732, Cl. 235-156.000.
Jackson, Philip Elmo: *See—*
Moore, James Melvin; Newell, William Gilbert; Hampton, Anthony Everette; and Jackson, Philip Elmo, 3,815,179.
Jacobs, Louis John. Bonding and forming inorganic materials. 3,816,158, Cl. 117-26.000.
Jahme, Hans Joachim. Apparatus for adjusting the relative positions of the cylinders in offset printing machines. 3,815,496, Cl. 101-218.000.
Jampen, Ulrich; and Zaba, Tadeusz, to Brown, Boveri & Company Limited. Apparatus for cooling an electrical generator. 3,816,751, Cl. 290-2.000.
Janik, Lee P., to Stanadyne, Inc. Air starter and lubricator throttle valve therefor. 3,816,040, Cl. 418-88.000.
Jansen, Theodore J., to Automatic Switch Company. Temperature compensator device and fluidic assembly incorporating it. 3,815,635, Cl. 137-833.000.
Janssen, Willem P. H. A.; and Paulissen, Martin G., to OCE-vander Grinten N.V. Drive for reciprocable parts of a photocopying optical system. 3,815,991, Cl. 355-66.000.
Janzow, Lester G.; and Lipke, Ronald D. Expansion joint. 3,815,818, Cl. 238-228.000.
Japan Atomic Energy Research Institute: *See—*
Kagiya, Tsutomu; Mitsui, Hiroshi; Hosoi, Fumio; Fujimoto, Takahiko; Takata, Hiroshi; Tsuneta, Kazuyoshi; and Ushirokawa, Masahiro, 3,816,284.
Jaulmes, Eric, to Ateliers de la Motobecane. Device for controlling the injection of fuel in internal combustion engines. 3,815,556, Cl. 123-32.0ea.
Jeffers, Frederick J.: *See—*
Duck, Sherman W.; Jeffers, Frederick J.; and Lemke, James U., 3,815,987.
Jefferson Chemical Company, Inc.: *See—*
Watts, Lewis William, Jr., 3,816,505.
Jehu, Robert Ramsay, to Spacetac Incorporated. Automatic converter tester. 3,816,813, Cl. 324-73.00r.
Jenkins, Murgatroyd H.: *See—*
DeWoskin, Irvin S.; and Jenkins, Murgatroyd H., 3,816,209.
Jenkins, Roger M.: *See—*
Streeter, John H.; and Jenkins, Roger M., 3,815,719.
Jennings, Rodney L.: *See—*
Jennings, Rodney L.; Teets, Rodney J.; Kerby, Perry L.; and Moss, Charles H. (said Teets, Kerby & Moss assor. to said), 3,816,731.
Jennings, Rodney L.; Teets, Rodney J.; Kerby, Perry L.; and Moss, Charles H., said Teets, Kerby & Moss assor. to said Jennings, Rodney L. Conversion apparatus utilized with an electronic calculator. 3,816,731, Cl. 235-156.000.
Jezo, Maurice L., to International Telephone and Telegraph Corporation. Echo protection for tacan/DME. 3,816,828, Cl. 343-6.51c.
Jirousek, Arthur E., to Anderson Machine and Tool Works, Inc. Machine for cutting non-rigid materials. 3,815,458, Cl. 83-83.000.
Jocelyn, William E. File device. 3,815,967, Cl. 312-327.000.
Johannessen, Jorgen Mosbaek, 1/2 to Sorensen, Per Pontoppidan. Universal basin for use in a sewer system. 3,815,748, Cl. 210-163.000.
Johns, Martha Marie; and Lynch, John Andrew, Jr., to Du Pont de Nemours, E. I., and Company. Disposable diaper. 3,815,602, Cl. 128-287.000.
Johns-Manville Corporation: *See—*
Genson, Samuel Richard, 3,815,461.
Zettel, Joseph H., 3,816,149.
Johnson & Johnson: *See—*
Broderick, Frank W., 3,815,493.
Johnson & Johnson, mesne: *See—*
Torney, Harry L., 3,816,261.
Johnson, Christopher Linley, to Rolls-Royce (1971) Limited. Control system. 3,816,715, Cl. 235-150.100.
Johnson, Jeffrey L., to General Motors Corporation. Energy absorbing steering column assembly. 3,815,438, Cl. 74-492.000.
Johnson, Nolton Clement, Jr.: *See—*
Weiner, Myron Jerome; Pothoven, Floyd Rufford; and Johnson, Nolton Clement, Jr., 3,816,700.
Johnson, Orlin W., to International Harvester Company. Straw chopper attachment for harvester combines. 3,815,823, Cl. 239-650.000.
Johnson, Paul Conrad. Fipple flute. 3,815,466, Cl. 84-380.000.
Johnson, Robert E.: *See—*
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Johnson, William L.: *See—*
Johnson, William L.; and Massey, William R. (said Massey assor. to said), 3,816,593.
Johnson, William L.; and Massey, William R., said Massey assor. to said Johnson, William L. Method of regenerating waste pickle liquor. 3,816,593, Cl. 423-140.000.
Jones, Cecil R., to Transfer Systems Incorporated. Bolt tensioning device especially adapted for use with nuclear reactor pressure vessel. 3,815,874, Cl. 254-29.00a.
Jones, Charles B.: *See—*
Rein, Charles R.; and Jones, Charles B., 3,815,867.
Jones, Charles Wright, to Xepex Industries, Inc. Method for forming carton. 3,815,484, Cl. 93-49.00m.
Jones, Clarence O., Jr., to Derrick Manufacturing Corporation. Vibrating apparatus. 3,815,473, Cl. 91-248.000.
Jones, Trevor O., to General Motors Corporation. Occupant restraint system. 3,815,935, Cl. 280-150.0ab.
Jooste, Abraham S. Irrigation sprinklers. 3,815,831, Cl. 239-498.000.
Joslin, Frederick R. ECM treatment of small holes. 3,816,272, Cl. 204-129.100.
Joyce, Benjamin Norman, Sr. Variable volume rotary vane pump having an integral opposed reciprocating piston internal combustion engine. 3,816,031, Cl. 417-364.000.
Joyce, John E., to International Equipment Company, mesne. Method and apparatus for producing a liquid concentration-volume gradient. 3,815,618, Cl. 137-1.000.
Jozsef Balogh: *See—*
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Judd, Edwin B., to General Electric Company. Wire connector with wire locating device. 3,816,819, Cl. 339-99.00r.
Juelke, Charles V.; and Cook, Norman K., said Juelke assor. to Celanese Corporation. Process for producing aromatic sulfonates. 3,816,520, Cl. 260-512.00r.
Jullig, Karl, to General Motors Corporation. Energy-absorbing bumper bar arrangement for motor vehicles. 3,815,946, Cl. 293-99.000.
Junggren, Ulf Krister: *See—*
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Lamm, Bo Robert, 3,816,533.
Junod, Pierre, to Ciba-Geigy AG. Process for the production of pure metal halibes. 3,816,601, Cl. 423-491.000.
Jurewicz, Anthony T., to Mobile Oil Corporation. Method for producing halobenzoyl halides. 3,816,526, Cl. 260-544.00m.
Jurgich, Donald. Cam cleat releasing mechanism. 3,815,538, Cl. 114-218.000.
Jurievich, Jury Iosifovich: *See—*
Mikhailov, Evgeny Leonidovich; Boiko, Valery Ivanovich; Nikolaev, Peter Ivanovich; Melnikov, Innokenty Alexandrovich; Eremin, Vladimir Alexandrovich; Revazov, Vyacheslav Georgievich; Jurievich, Jury Iosifovich; and Losev, Gennady Evgenievich, 3,815,879.
Just, George E.: *See—*
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Just, George E.; and Simonovitch, Chaim, said Somonovitch assor. to said Just, George E. Prostaglandin F analogs. 3,816,508, Cl. 260-468.00d.
Kablaoui, Mahmoud S.; Love, Richard F.; and Durandeau, Roger G., to Texaco Inc. Preparation of caprolactam. 3,816,404, Cl. 260-239.30a.
Kabushiki Kaisha Suwa Seikosha: *See—*
Yamazaki, Yoshio, 3,816,334.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Suzuki, Masaru; Iwata, Masayoshi; and Matsui, Takeo, 3,816,680.
Kafer, Nicholas, to Lummus Company, The. Hydrogen chloride recovery. 3,816,599, Cl. 423-488.000.
Kagiya, Tsutomu; Mitsui, Hiroshi; Hosoi, Fumio; Fujimoto, Takahiko; Takata, Hiroshi; Tsuneta, Kazuyoshi; and Ushirokawa, Masahiro, to Japan Atomic Energy Research Institute. Radiation grafting of vinyl monomers onto cellular polymeric substrates. 3,816,284 Cl. 204-159.170.

Kainson, Anatoly Yakovlevich; Razygraev, Jury Sergeevich; Sorokin, Nikolai Elizarovich; Dobrokhotov, Sergei Alexandrovich; Sokolov, Veniamin Prokofievich; Zaitsev, Nikolai Ivanovich; Zandman, Boris Genikhovich; Telyatnikov, Boris Peisakhovich; Kholin, Nikoai Dmitrievich; and Ryazanov, Alexei Nikolaevich. Method and apparatus for introducing liquid into root zone of plants in soil. 3,815,525, Cl. 111-6.000.

Kaiser Aluminum & Chemical Corporation: *See—*
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Kakauda, Toshiaki: *See—*
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Kakutani, Kazuo: *See—*
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Kalle Aktiengesellschaft: *See—*
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Kaltenbach & Voigt: *See—*
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Kamens, Ernest Rudolph: *See—*
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Kammerer, Heinz: *See—*
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Kampfer, Helmut; Gotze, Johannes; Von Konig, Anita; and Ohlschlager, Hans, to Agfa-Gevaert Aktiengesellschaft. Photographic dry copying process. 3,816,131, Cl. 96-29.00d.

Kampmann, Gerhard: *See—*
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Kamyr Aktiebolag: *See—*
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Kanada, Nobuo: *See—*
Iida, Kosuke; Kanada, Nobuo; and Kurita, Takeji, 3,815,640.

Kander, Abdenoor. Toy structure utilizing a container. 3,815,281, Cl. 46-11.000.

Kaneko, Haruo; Katagiri, Yoshio; and Okada, Tomonori, to Nippon Electric Company, Limited. Drift-compensated double sampling sequential feedback type encoding system. 3,816,825, Cl. 340-347.0ad.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Higaki, Taiji; and Mikumo, Masao, 3,816,838.

Kanzaki, Toshihiko: *See—*
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Kaplar, Zsigmond: *See—*
Apostol, Tamas; Barna, Janos; Egri, Alajos; Kaplar, Zsigmond; and Majtenyi, Tibor, 3,815,835.

Karbowski, Sylvester G. Roller support assembly for machine carriage. 3,815,293, Cl. 51-231.000.

Karger, Eva R.; and MacGregor, Paul T., to Polaroid Corporation. Photographic processes and products employing mixed indole/phenol phthaleins as optical filter agents. 3,816,124, Cl. 96-3.000.

Karger, Eva R.; and MacGregor, Paul T., to Polaroid Corporation. Indicator dyes process for preparing naphthalide. 3,816,453, Cl. 260-326.13r.

Karmas, George, to Ortho Pharmaceutical Corporation. Derivatives of the 2-(lower alkyl)-3-(lower alkyl)-4-aryl-3-or-4-cyclohexenecarbinols. 3,816,507, Cl. 260-468.00r.

Kashima, Hiroshi; Tsujimoto, Hideyuki; and Kakauda, Toshiaki, to Asahi Kasei Kabushiki Kaisha. Process for the manufacture of synthetic bulky filament fibers. 3,816,583, Cl. 264-282.000.

Katagiri, Yoshio: *See—*
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Kato, Fumio: *See—*
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Kato, Keizo: *See—*
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Kato, Koichi: *See—*
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Katter, Gene S. Gravity ore classifier. 3,815,737, Cl. 209-44.000.

Kaufman, Harold, to Houdaille Industries, Inc. Punch press. 3,815,462, Cl. 83-410.000.

Kaufman, Harry: *See—*
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Kaukeinen, Joseph Y., to Eastman Kodak Company. Multilayer electrophotographic element containing high contrast and opaque barrier layers. 3,816,117, Cl. 96-1.500.

Kawai, Sadaharu: *See—*
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Kawakami, Koichi, to Yoshida Kogyo Kabushiki Kaisha. Slider holder for concealed fastener chain. 3,815,208, Cl. 29-207.5sl.

Kawakita, Katsuhiko: *See—*
Shimotori, Kazumi; Tokoro, Hirokazu; Nakamura, Shinichi; and Kawakita, Katsuhiko, 3,816,110.

Kay, Clifford: *See—*
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Kazik, Raymond A., to Orthokinetics, Inc. Orthopedic chair with scoliosis pads. 3,815,586, Cl. 128-70.000.

Keener, Gary F.; Choiniere, Alcide; and Richitelli, Charles G., to Automation Industries, Inc. Disposable face mask. 3,815,596, Cl. 128-188.000.

Kehrer, Fritz: *See—*
Bitterli, Peter; and Kehrer, Fritz, 3,816,448.

Keim, Melville. Wind direction indicator. 3,815,412, Cl. 73-188.000.

Kelham, Michael Geoffrey, to Imperial Chemical Industries Limited. Injection method. 3,816,515, Cl. 260-497.00a.

Keller, Alois, to Gebrueder Buehler AG. Plansifter mounting and clamping apparatus. 3,815,741, Cl. 209-319.000.

Keller, Douglas V., Jr.: *See—*
Aldrich, Robert G.; Keller, Douglas V., Jr.; and Sawyer, Richard G., 3,815,826.

Kelly, Robert C., to Upjohn Company, The. Tricyclic lactone bisalkanesulfonates. 3,816,460, Cl. 260-343.300.

Kelly, Robert C., to Upjohn Company, The. Tricyclic lactone epoxides. 3,816,461, Cl. 260-343.300.

Kelly, Robert C., to Upjohn Company, The. Tricyclic lactone aldehyde. 3,816,462, Cl. 260-343.300.

Kelly, Robert C., to Upjohn Company, The. Tricyclic glycol. 3,816,463, Cl. 260-343.300.

Kempermann, Theo; and Eholzer, Ulrich, to Bayer Aktiengesellschaft and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the vulcanization of natural or synthetic rubber. 3,816,323, Cl. 252-182.000.

Kendall Company, The: *See—*
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Kennecott Copper Corporation: *See—*
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Kennerk, Robert D.: *See—*
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Kenney, John Thomas; and Litt, Frederic Alan, to Western Electric Company Incorporated. Dispersing a water-immiscible liquid in an aqueous medium. 3,816,329, Cl. 252-312.000.

Kensington Scientific Corporation: *See—*
Allen, Donald M.; and Lee, Thomas E., 3,815,790.

Kentner, Willard E. Vise for plastic pipe. 3,815,888, Cl. 269-2.000.

Kerby, Perry L.: *See—*
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Kerst, Al F., to Monsanto Company. Preparation of ethane disposphinic acids substituted with both amine and hydroxy groups. 3,816,518, Cl. 260-502.500.

Kessler, Gerald. Corrugated metal siding with loose plastic film facing. 3,815,310, Cl. 52-531.000.

Keyes, Wilmer. Apparatus for delivering power. 3,815,366, Cl. 60-698.000.

Khaimov, Mikhail Rashidovich; and Kheifets, Evgeny Mikhailovich. Electromechanical converter of flexural vibrations. 3,816,775, Cl. 310-9.600.

Kheifets, Evgeny Mikhailovich: *See—*
Khaimov, Mikhail Rashidovich; and Kheifets, Evgeny Mikhailovich, 3,816,775.

Kholin, Nikolai Dmitrievich: *See—*
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Kidney, Allan James: *See—*
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Kiesling, Casper, to Peska, Lawrence, Associates, Inc. Mercury circuit clock. 3,815,352, Cl. 58-23.00r.

Kikkoman Shoyu Co., Ltd.: *See—*
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Kikumoto, Ryoji: *See—*
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Killark Electric Manufacturing Company: *See—*
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Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 2-Aryl-4-amino-5-cyano pyrimidine derivatives. 3,816,423, Cl. 260-256.40n.

Kimberly-Clark Corporation: *See—*
Stumpe, Robert J., 3,816,228.

Kimura, Ichiro; Takahashi, Yoshiro; and Ito, Hideo, to Kumiai Chemical Industry Co., Ltd. 2-Chlorobenzyl N,N-diethylthiocarbamate. 3,816,500, Cl. 260-455.00a.

King, Claude F., to Receptors. Binary sequence generator. 3,816,764, Cl. 307-260.000.

King, Thomas M.; and Mitchell, Robert S., to Monsanto Company. Methods of inhibiting corrosion with condensed polyalkylenepolyamine derivatives. 3,816,333, Cl. 252-389.00a.

King-Seeley Thermos Co.: *See*—
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Kino, Gordon S.: *See*—
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Kinoshita, Shinji; and Kobayashi, Tadashi, to Hokkaido University. Method and apparatus for preparing vectorcardiograms with colors in accordance with depth. 3,816,849, Cl. 358-81.000.

Kinslow, William G., Jr.: *See*—
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Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Process for the production of halogen-containing V-triazole compounds. 3,816,413, Cl. 260-240.00c.

Kirschner, Robert K., to Sundstrand Data Control, Inc. Head-up display. 3,816,005, Cl. 356-251.000.

Kishino, Seigo, to Hitachi Ltd. Method and apparatus for measuring lattice parameter. 3,816,747, Cl. 250-276.000.

Kitajima, Nobuo: *See*—
Kundo, Hideyo; Masaki, Tatsuo; and Kitajima, Nobuo, 3,816,116.

Kitao, Teijiro: *See*—
Konishi, Kenzo; Kitao, Teijiro; Matsuoka, Masaru; and Shiozaki, Hisayoshi, 3,816,431.

Klaus Esser KG: *See*—
Heitner, Alfred, 3,816,687.

Klausner, Bracha. Apparatus and methods relating to support of the forearm. 3,815,588, Cl. 128-77.000.

Kleemann, Axel; Schreyer, Gerd; and Weiberg, Otto, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of glycide. 3,816,479, Cl. 260-348.50l.

Kleenaire Recycling Systems, Inc.: *See*—
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Klein, Edward I., to V-Mark Automation Ltd. Conveyor. 3,815,726, Cl. 198-219.000.

Kleindrettle, Karl: *See*—
Becker, Georg; and Kleindrettle, Karl, 3,815,535.

Kleinmeyer, Vernon T.; and Schinner, Thomas J., to Cincinnati Time Recorder Company, Inc. Embossed card reader. 3,816,707, Cl. 235-61.11c.

Kleinschmidt, David Charles, to Procter & Gamble Company, The. Laundering aid. 3,816,321, Cl. 252-134.000.

Klockner-Humboldt Duetz Aktiengesellschaft: *See*—
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Klopf, Adam F., to Dow Chemical Company, The. Screeding apparatus. 3,816,014, Cl. 404-114.000.

Klotzbach, Kurt. Drive mechanism for a conveyor device for producing an intermittent conveying movement in accordance with a desired pattern of movement. 3,815,433, Cl. 74-393.000.

Klutchko, Sylvester: *See*—
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Klygis, Mindaugas Julius; and Brezette, Michael Warren, to Illinois Tool Works Inc. Container carrier. 3,815,732, Cl. 206-163.000.

Kneusel, Raymond H. P., to Crown Cork & Seal Company, Inc. Pressure release valves for aerosol cans. 3,815,534, Cl. 113-15.00a.

Kniepkamp, Hermann, to Siemens Aktiengesellschaft. Method of producing thick schottky-barrier contacts. 3,816,270, Cl. 204-15.000.

Knohl, Richard B.: *See*—
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Zeffren, Eugene; and Knohl, Richard B., 3,816,615.

Knott, Allan William. Tool posts. 3,815,454, Cl. 82-36.00r.

Kobashigawa, Alvin I.: *See*—
Lee, Henry L., Jr.; Orlowski, Jan Alexander; and Kobashigawa, Alvin I., 3,815,239.

Kobayashi, Hidehiko; and Sasaguri, Kiichiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Film of polyethylene-1,2-diphenoxy-ethane-4,4'-dicarboxylate copolymer. 3,816,368, Cl. 260-47.00c.

Kobayashi, Tadashi: *See*—
Kinoshita, Shinji; and Kobayashi, Tadashi, 3,816,849.

Kobel, Erwin H.: *See*—
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Kobelt, Jack R., to Self-adjusting linear actuator. . 3,815,471, Cl. 91-189.000.

Kober, Leslie Z.; and Bailey, Maurice C., to LogEtronics Inc. Treadle-actuated closures. 3,815,656, Cl. 160-123.000.

Kobetz, Paul: *See*—
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Kobinger, Walter: *See*—
Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; and Diederen, Willie, 3,816,403.

Kobylinski, Tadeusz P.; and Taylor, Brian W., to Gulf Research & Development Company. Process for reducing the content of nitrogen oxides in the exhaust gases for internal combustion engines. 3,816,594, Cl. 432-213.500.

Koch, Richard F. Signal compression and expansion apparatus with means for preserving or varying pitch. 3,816,664, Cl. 179-15.55t.

Koch, Wolfgang: *See*—
Erdmann, Dietrich; Schuhrer, Klemens; Koch, Wolfgang; and Gerhart, Schneider, 3,816,464.

Kocher, Haribhajan S.: *See*—
Thettu, Raghulinga R.; and Kocher, Haribhajan S., 3,816,066.

Koebel, Alan D., Jr., to Hulet, James L. Portable stake remover. 3,815,875, Cl. 254-132.000.

Koehler, Albert M., to Brown & Root, Inc. Offshore tower apparatus and method. 3,815,371, Cl. 61-46.500.

Koehler-Dayton, Inc.: *See*—
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Kogayashi, Akiro: *See*—
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Koguchi, Yohko: *See*—
Ariyoshi, Yasuo; Koguchi, Yohko; Yamatani, Tetsuo; and Koji, Toi, 3,816,471.

Kohl, Karl. Coupling frame for the pipe frame for warp beam bearings. 3,815,384, Cl. 66-86.00a.

Koji, Toi: *See*—
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Kojima, Katumi: *See*—
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Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
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Kolbinger, Herman Joseph. Rotary engine. 3,815,362, Cl. 60-525.000.

Koleske, Joseph V.: *See*—
Critchfield, Frank E.; and Koleske, Joseph V., 3,816,566.

Koloch, Klaus E.; and Doe, Lester Adrian, Jr., to General Electric Company. Stabilized polyphenylene ether compositions. 3,816,562, Cl. 260-874.000.

Komaki, Takao: *See*—
Sato, Masamichi; and Komaki, Takao, 3,815,545.

Komori, Hideo, to Kuroda Seiko Co., Ltd. Quick-change toolholder for non-revolvable tools. 3,815,928, Cl. 279-1.00b.

Konishi, Kenzo; Kitao, Teijiro; Matsuoka, Masaru; and Shiozaki, Hisayoshi, to Mitsubishi Chemical Industries Ltd. Bromine or chlorine containing quinophthalone pigments. 3,816,431, Cl. 260-289.0qp.

Konishi, Tatsuo: *See*—
Otsuka, Hiroaki; Manabe, Norihisa; and Konishi, Tatsuo, 3,816,850.

Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 3,816,422.

Korn, Sebald R.; Fox, Richard W.; and Sahm, William H., III, to General Electric Company. Zero voltage switching photon coupled relay. 3,816,763, Cl. 307-252.0ua.

Koskolos, Nick J., to Intertherm, Inc. Safety pilot enclosure having flame-diverting air inlet. 3,816,060, Cl. 431-350.000.

Kostrowski, John J.: *See*—
Larkin, William A.; Kostrowski, John J.; and Touval, Irving, 3,816,367.

Kotler, Gerald R.: *See*—
Gallagher, Peter Christopher John; and Kotler, Gerald R., 3,815,660.

Kotting, Wolfgang; and Zakrezewski, Erhard, to Steuler Industriewerke G.m.b.H. Gas-liquid contact device. 3,815,334, Cl. 55-227.000.

Kotz, Arthur R., to Minnesota Mining and Manufacturing Company. Electrographic recording process and apparatus using conductive toner subject to a capacitive force. 3,816,840, Cl. 346-74.0es.

Koula, Zdenek, to Stotz & Co. Method of and apparatus for generating, maintaining or re-establishing a vacuum in a vacuum vaporization apparatus for heating one or more liquids. 3,815,552, Cl. 122-33.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Kumpf, Hermann, 3,816,246.

Krag, Niels; Hernandez, Ernest S.; and Horvath, Kalman, to Electronic Memories and Magnetics Corporation. Method for laying wires on tape. 3,816,205, Cl. 156-178.000.

Kraus, Max H., to Electro-Nite Co. High temperature molten metal thermocouple. 3,816,183, Cl. 136-234.000.

Kraus, Theodore C., to Olin Mathieson Chemical Corporation. Method for preparing non-solvated aluminum hydride. 3,816,606, Cl. 423-645.000.

Kravitz, Stanley: *See*—
Wilson, Raymond F.; Estes, John H.; and Kravitz, Stanley, 3,816,294.

Kray, William C., Jr.: *See*—
Stephens, Robert D.; and Kray, William C., Jr., 3,816,345.

Krenzke, Leonard D.: *See*—
Gallagher, James P.; and Krenzke, Leonard D., 3,816,300.

Krimmel, Carl Peter, to Searle, G. D., & Co. Esters of 3-phenyladamantane-1-carboxylic acid. 3,816,509, Cl. 260-469.000.

Kroger, Harry; and Potter, Curtis N., to Sperry Rand Corporation. High frequency diode and method of manufacture. 3,816,194, Cl. 156-3.000.

Krohn, Holger, to Rexroth, G. L., GmbH. Arrangement for converting polar coordinate servo actuating signals into rectangular coordinate actuating signals. 3,816,736, Cl. 235-186.000.

Kruckel, Peter Alexander, to Messrs. Schwan-Bleistift-Fabrik. Dispenser. 3,815,734, Cl. 206-443.000.

Krueger, Friedrich; Bauer, Lieselotte; and Michel, Walter, to Benckiser, Joh. A., GmbH. Process of producing amino methylene phosphonic acids. 3,816,517, Cl. 260-502.500.

Kucera, Joseph B., 1/2 to Lowell, Rudolph L. Machine for forming large round bales of a fibrous material. 3,815,344, Cl. 56-341.000.

Kufal, Georgy Eduardovich: *See—*
Vasiliev, Vladimir Pavlovich; Glukhovskoi, Boris Mikhailovich; Golubovsky, Oleg Mikhailovich; Kufal, Georgy Eduardovich; and Pliev, Leonid Filippovich, 3,815,977.

Kuhl, Ronald David. Power digger for landscape gardeners. 3,815,689, Cl. 173-27.000.

Kuji, Yoichi: *See—*
Saito, Nagao; and Kuji, Yoichi, 3,816,292.

Kulig, Constantine W., to Emhart Corporation. Apparatus for processing containers. 3,815,248, Cl. 33-174.00l.

Kumiai Chemical Industry Co., Ltd.: *See—*
Kimura, Ichiro; Takahashi, Yoshiro; and Ito, Hideo, 3,816,500.

Kummer, Werner: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 3,816,422.

Kumpf, Hermann, to Kraftwerk Union Aktiengesellschaft. Concrete pressure vessel for pressurized or boiling-water nuclear reactors. 3,816,246, Cl. 176-65.000.

Kundo, Hideyo; Masaki, Tatsuo; and Kitajima, Nobuo, to Canon Kabushiki Kaisha. N-type photosensitive member for electrophotography. 3,816,116, Cl. 96-1.500.

Kunze, Bernhard, to Hegenscheidt, Wilhelm, Kommanditgesellschaft. Apparatus for rolling cylindrical surfaces on a workpiece. 3,815,396, Cl. 71-121.000.

Kuraray Co., Ltd.: *See—*
Takei, Masuya, 3,816,216.

Kurita, Takeji: *See—*
Iida, Kosuke; Kanada, Nobuo; and Kurita, Takeji, 3,815,640.

Kuroda Seiko Co., Ltd.: *See—*
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Kuroyanagi, Masasi: *See—*
Masuda, Noboru; Kuroyanagi, Masasi; and Matukawa, Takashi, 3,816,826.

Kurz, Arthur W., Jr., to Donnelly Mirrors, Inc. Day/night rearview mirror. 3,815,976, Cl. 350-280.000.

Kuster, Karl H., to GTE Automatic Electric Laboratories, Incorporated. Power supply having improved over-voltage protection. 3,816,809, Cl. 321-14.000.

Kuyper, Herman S., to Rolscreen Company. Covered window sash and method for making the same. 3,815,285, Cl. 49-501.000.

Kyle, John V., Sr. Method for connecting pipe to a manhole. 3,815,214, Cl. 29-450.000.

Kyorin Seyaku Kabushiki Kaisha: *See—*
Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; Naruke, Takeshi; Fumihiko, Morinaga; and Takeshi, Naruke, 3,816,629.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Nakayama, Kiyoshi; Furuya, Akira; and Ukita, Masayo, 3,816,251.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Arai, Yukou; and Kato, Fumio, 3,816,258.

La Combe, Donald J., to General Electric Company. Passivation of photoresist materials used in selective plasma etching. 3,816,196, Cl. 156-8.000.

La Combe, Donald J.; and Babcock, Guy L. Selective plasma etching of organic materials employing photolithographic techniques. 3,816,198, Cl. 156-16.000.

La Mar Zollinger, Joseph: *See—*
Croft, Thomas S.; and La Mar Zollinger, Joseph, 3,816,416.

Laarman, Johannes Bertus, to N. V. Industrieele Handelscombinatie. Method and apparatus for sucking up material from the bottom of a body of water. 3,815,267, Cl. 37-58.000.

Laclair, Albert W., to Nashua Corporation. Thermographic copy sheet containing phthalimide. 3,816,139, Cl. 96-114.100.

Lafferty, James M., to General Electric Company. Triggerable vacuum arc device suitable for alternating current operations. 3,816,798, Cl. 315-330.000.

Lahaye, Paul G.; Craig, Glenn D.; and Turecek, Joseph L., to Aqua-Chem, Inc. Method and apparatus for removing nitrogen oxides from a gas stream. 3,816,595, Cl. 423-239.000.

Laibowitz, Robert B.: *See—*
Cuomo, Jerome J.; Laibowitz, Robert B.; Mayadas, Ashok F.; and Rosenberg, Robert, 3,816,845.

L'Air Liquide, Societe Anonyme pour l'Etude et: *See—*
Malafosse, Jean, 3,816,604.

Lambert, Alfred F., to Canadian Patents and Development Limited. Survey instrument tower. 3,815,708, Cl. 182-129.000.

Lambert, Maurice C., to United States of America, Atomic Energy Commission. Determination of hypophosphite ion concentration. 3,816,075, Cl. 23-230.00r.

Lamborghini Oleodinamica S.p.A.: *See—*
Menini, Corrado, 3,816,042.

Laminated ski having cellular plastic core and method for producing the same: *See—*
Hashimoto, Osamu; and Takabayashi, Yoshikazu, 3,816,573.

Lamm, Bo Robert: *See—*
Brandstrom, Arne Elof; Gustavii, Klas Ragnar; Junggren, Ulf Krister; and Lamm, Bo Robert, 3,816,533.

Lamphere, Eugene R. Door frame security plate. 3,815,945, Cl. 292-340.000.

Lamy, Jean-Marc: *See—*
Chretien, Gilbert; Cirard, Philippe; Lamy, Jean-Marc; and Menard, Christophe, 3,816,560.

Lancz, Albert Jay, to Colgate-Palmolive Company. Industrial car wash composition. 3,816,351, Cl. 252-527.000.

Land, Edwin H., to Polaroid Corporation. Photographic processing projecting apparatus. 3,815,971, Cl. 350-130.000.

Landauer, Leroy; and Zukowski, Ronald Joseph, to American Can Company. Method of repair electrocoating a metal substrate. 3,816,289, Cl. 204-181.000.

Landsman, Robert M., to Perkin-Elmer Corporation, The. Scanning apparatus. 3,816,659, Cl. 178-7.600.

Lane Company, Inc., The: *See—*
Rogers, W. Clark, Jr.; and Snitzer, Morton, 3,815,954.

Langen & Co.: *See—*
Strauff, Gunther, 3,816,030.

Langenegger, Werner: *See—*
Baumann, Arthur; and Langenegger, Werner, 3,816,156.

Lankard, John R.: *See—*
Hodgson, Rodney T.; Lankard, John R.; Sorokin, Peter P.; and Wynne, James J., 3,816,754.

Lanker, Willi, to Turlabor, A.G. Process for treating photoconductors. 3,815,295, Cl. 51-289.00r.

Larger, Dominique Marie, to Eau et Assainissement Socea. Process and apparatus for simultaneously incinerating combustible waste and sludge. 3,815,522, Cl. 110-8.00r.

Larive, Calvin Arthur: *See—*
Larive, Francis Paul; and Larive, Calvin Arthur, 3,815,696.

Larive, Francis Paul; and Larive, Calvin Arthur. Snowmobile banking mechanism. 3,815,696, Cl. 180-5.00r.

Larkin, William A.; Kostrowski, John J.; and Touval, Irving, to M & T Chemicals Inc. Flame retardant compositions. 3,816,367, Cl. 260-29.60r.

Laser Alignment, Inc.: *See—*
Roodvoets, Roger J.; and Stapert, James, Jr., 3,815,250.

Laser Sciences, Inc.: *See—*
Gugliotta, George; and Bradt, David M., 3,816,746.

Lasergruppen Konsalt AB: *See—*
Colding, Bertil; Abramson, Nils; and Sandstrom, Unto, 3,815,996.

Lassen, Jorgen Buus: *See—*
Hernestam, Sven Erik Harry; Sterner, Nils Olov Bruno; and Lassen, Jorgen Buus, 3,816,433.

Latta, Lee M. Automobile anti-theft device. 3,815,391, Cl. 70-209.000.

Laudise, Michael A., to General Mills Chemicals, Inc. Acrylic adducts of amino-amides of monomeric fatty compounds. 3,816,366, Cl. 260-23.0ep.

Laufer, Berek. Key retainer. 3,815,392, Cl. 70-456.00b.

Laughton, Charles: *See—*
Wichinsky, Michael; and Laughton, Charles, 3,815,912.

Lavery, Adelbert L., to United States of America, Transportation. Resonance tire inspection method and apparatus. 3,815,407, Cl. 73-67.200.

Lavitch, Bernard R.; and Morry, Bernard H. Button fastener. 3,815,798, Cl. 223-102.000.

Lawley, Clyde Murrell. Apparatus for removing oxygen from liquids. 3,815,330, Cl. 55-168.000.

Le Blanc, John R., to Monsanto Company. Beneficiating agents. 3,816,308, Cl. 252-8.50a.

Le Materiel Medical Scientifique: *See—*
Beaumont, Georges, 3,815,593.

Le Tourneau, R. G., Inc.: *See—*
Molby, Lloyd A., 3,815,938.

Lear Motors Corporation: *See—*
Lear, William P., 3,816,055.

Lear, William P., to Lear Motors Corporation and Reingiter means for power combustors. . 3,816,055, Cl. 413-171.000.

Leatherman, Alfred F.: *See—*
Heller, William C., Jr.; and Leatherman, Alfred F., 3,816,574.

Lechner, Alfred: *See—*
Dear, Terrence A.; Lechner, Alfred; and Swartout, Willson C., 3,816,713.

Lee, Cheuk Man, to Abbott Laboratories. 1-(5-Phenyl-4-oxo-2-oxazolin-2-yl)piperazines. 3,816,426, Cl. 260-268.00c.

Lee, Henry L., Jr.; Orlowski, Jan Alexander; and Kobashigawa, Alvin I. Method of filling and sealing developmental pit and fissures. 3,815,239, Cl. 32-15.000.

Lee, Kenneth: *See—*
Barrall, Edward Martin; and Lee, Kenneth, 3,816,237.

Lee, Raymond, Organization, Inc., The: *See—*
Chapman, Branch W., 3,815,915.
Schamber, James N., 3,815,797.

Lee, Roberto, to Monsanto Company. Separation by crystallization in presence of water. 3,816,551, Cl. 260-646.000.

Lee, Thomas E.: *See—*
Allen, Donald M.; and Lee, Thomas E., 3,815,790.

Leeds & Northrup Company: *See—*
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Leendertz, Jack Albert: *See—*

Butters, John Neil; and Leendertz, Jack Albert, 3,816,649.

Legnick, Guenther Fritz: *See—*
Pepe, Anthony Enrico; Legnick, Guenther Fritz; and Neuroth, Charles George, 3,816,164.

Lehmann, Hans Rudolf: *See—*
Goiffon, Thierry; Lehmann, Hans Rudolf; and Schaidl, Hubert, 3,815,470.

Leifheit, Guenter, to Leifheit International Guenter Leifheit KG. Brushing apparatus. 3,815,167, Cl. 15-42.000.

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Leland Stanford Junior University, The Board of: *See—*
06/11/74; and Kino, Gordon S., 3,816,753.

Lemberg, Seymour; and Cain, Audley L., to Stepan Chemical Company. 14-Oxobicyclo[10.4.0]hexadec-1(12)-ene, 14-oxobicyclo[10.4.0]hexadec-12-ene, 14-oxobicyclo[10.4.0]-hexadecane and processes for their preparation. 3,816,534, Cl. 260-586.00r.

Lemke, James U.: *See—*
Duck, Sherman W.; Jeffers, Frederick J.; and Lemke, James U., 3,815,987.

Lemmons, William R.: *See—*
Sanborn, James E.; Lemmons, William R.; and Ramey, James M., 3,816,539.

Lenane, Denis L., to Ethyl Corporation. Exhaust system. 3,815,337, Cl. 55-276.000.

Lenane, Denis L., to Ethyl Corporation. Exhaust system. 3,815,338, Cl. 55-276.000.

Lench, Robert, to American Standard Inc. Bullet resistive door. 3,815,312, Cl. 52-622.000.

Lennox, Richard B., to Spiroll Corporation Ltd. Method of forming spiral or helical tunnels and sections therefor. 3,815,370, Cl. 61-45.00r.

Lenz, George R., to Searle, G. D., & Co. 3-Oxygenated 21-dialkylamino-20-methyl-5 alpha-pregn-17(20)-dien-3-ones and congeners. 3,816,480, Cl. 260-397.100.

Leopold, Wilbur R., Jr.; and Smith, John J.; deceased (by Smith, Beatrice A.; executor). Gas meter setting or the like. 3,815,859, Cl. 248-300.000.

L'Equipement et la Construction Electrique E.C.E.: *See—*
Auchapt, Rene, 3,816,822.

Lerner, Bernard, to Automated Packaging Systems, Inc. Packaging method and apparatus. 3,815,318, Cl. 53-29.000.

Lerner, Martin L., to Zenith Radio Corporation. Re-etch apparatus with constant flow rate means. 3,816,214, Cl. 156-345.000.

Leser, Robert: *See—*
Nitzsche, Siegfried; Strasser, Rudolf; Leser, Robert; and Helmut, Spork, 3,816,493.

Levene, Leon, to Owend-Illinois, Inc. Method of preparing luminescent and photoconductive materials. 3,816,328, Cl. 252-301.60s.

Lever Brothers Company: *See—*
Hamlyn, Maxwell Charles; Kidney, Allan James; and Owen, Alexander, 3,816,632.

Levin, Simon. Urinary device. 3,815,581, Cl. 128-2.00f.

Levingston-Armadillo, Inc.: *See—*
Bain, Billy R., 3,815,300.

Lewis, Geoffrey Arthur; and Bloom, Joseph Louis, to Lucas Aerospace Limited. Control vane arrangement for a gas turbine engine. 3,816,021, Cl. 415-147.000.

Lewis, Sheldon N.; and Yunaska, Matthew R., to Rohm & Haas Company. Nitrocellulose-modified urethane coating compositions and their use in finishing leather. 3,816,168, Cl. 117-142.000.

Licata, William H., to United States of America, Navy. Vector summer circuit using time sharing. 3,816,737, Cl. 235-192.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Hochl, Bernhard; and Rapparlie, Hans, 3,815,897.

Liden, Thomas M.; and May, John E., Jr. Hydrocracking process. 3,816,297, Cl. 208-111.000.

Lilly, Eli and Company: *See—*
Raun, Arthur P., 3,816,618.

Limburg, Jan Hendrik Harmanus; and Grubben, Henri Peter Johannes. U.S. Philips Corporation Switching network for a telecommunication exchange. 3,816,667, Cl. 179-18.0ge.

Lin, Kingso C., to Owens-Corning Fiberglas Corporation. Glass fiber size composition. 3,816,235, Cl. 161-175.000.

Linarducci, Joseph S.: *See—*
Rapoza, Edward J.; Siegel, Maxwell E.; Estelle, Weems E.; Petrucci, Pasquale M.; Linarducci, Joseph S.; Hamma, John; and Montgomery, John, 3,815,769.

Lindbeck, Simon Lloyd: *See—*
White, Rowland Kent; and Lindbeck, Simon Lloyd, 3,816,851.

Lindbert, Brook A.: *See—*
DeLorean, John Z.; and Lindbert, Brook A., 3,815,703.

Lindemann, Karl H. Electroless chromium plating process and composition. 3,816,142, Cl. 106-1.000.

Lindenschmidt, Robert E., to Whirlpool Corporation. Mullion butter conditioning compartment. 3,815,669, Cl. 165-30.000.

Linderman, Shayne T. Conveyor chain apparatus. 3,815,725, Cl. 198-195.000.

Lindsay Donald J.: *See—*
Hurlbut, Russell G.; Lindsay Donald J.; and Sproul, John C., 3,816,219.

Lindsay, Robert Joseph: *See—*
Beswick, Geoffrey Ernest; and Lindsay, Robert Joseph, 3,816,499.

Lingenhohle, Bernard; and Saupe, Martin, to Kaltenbach & Voigt Biberach. Dental handpiece with built-in coolant duct. 3,815,241, Cl. 32-28.000.

Link, Joseph J., Jr.; and Marsh, Gale D., to Bethlehem Steel Corporation. Method of deoxidizing and desulfurizing ferrous alloy with rare earth additions. 3,816,103, Cl. 75-58.000.

Linn, Bruce O., to Merck & Co., Inc. Novel chemical compounds and processes for preparing same. 3,816,530, Cl. 260-564.00f.

Lion Fat & Oil Co., Ltd.: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Ito, Humio, 3,816,575.

Lipke, Ronald D.: *See—*
Janzow, Lester G.; and Lipke, Ronald D., 3,815,818.

Liska, Erich, to Payer-Lux Eduard Payer. Shear foil for a dry shaver. 3,815,232, Cl. 30-346.510.

Litke, E. David, to Dynamics Research Corporation. Sealed linear encoder. 3,816,003, Cl. 356-169.000.

Litle, Robert L.: *See—*
Ting, Philip; and Litle, Robert L., 3,816,743.

Litt, Frederic Alan: *See—*
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Little, Arthur D., Inc.: *See—*
Huska, Paul A.; and Meissner, Herman P., 3,816,590.

Little, Lambert Ronald: *See—*
Graham, Cecil Robert Montgomery; and Little, Lambert Ronald, 3,815,886.

Liu, Sie T., to Honeywell Inc. Pyroelectric detector. 3,816,750, Cl. 250-338.000.

Lloyd, Robert M.: *See—*
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Wu, Yao-Hua; and Lobeck, Walter G., 3,816,454.

Lockheed Aircraft Corporation: *See—*
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Loeber, Frederick W., to Ameron, Inc. Elastomeric joint seal. 3,815,864, Cl. 249-179.000.

Loffelman, Frank Fred, to American Cyanamid Company. N-carbamoylethyl aromatic amine compounds. 3,816,529, Cl. 260-558.00a.

Lofredo, Antony; and Surowiec, Alfred J., to Airco, Inc., mesne and Process and system for the production and purification of helium. . 3,815,376, Cl. 62-22.000.

Loge, Hans, to Kaltenbach & Voigt. Coupling for dental handpieces. 3,815,240, Cl. 32-26.000.

LogEtronics Inc.: *See—*
Kober, Leslie Z.; and Bailey, Maurice C., 3,815,656.

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Lohringer, Werner: *See—*
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Lohse, Friedrich: *See—*
Schmid, Rolf; Lohse, Friedrich; Fisch, Willy; and Batzer, Hans, 3,816,365.

Loise, Joseph A.: *See—*
Bobrowsky, Charles A.; and Loise, Joseph A., 3,815,332.

Loliger, Willi; and Schmied, Rudolf. Apparatus for continuously dissolving a pulverulent material in a liquid. 3,816,427, Cl. 23-271.000.

Long, Raymond E. Apparatus for producing super heated fluids. 3,816,689, Cl. 219-100.550.

Longo, Joseph F., to International Dynetics Corporation. Garbage compactor. 3,815,323, Cl. 53-124.00e.

Longyear Company: *See—*
Cooper, Jamshed Rustom, 3,815,690.

Lonza Ltd.: *See—*
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Loopco Industries, Inc.: *See—*
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L'Oreal: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,815,793.

Losev, Gennady Evgenievich: *See—*
Mikhailov, Evgeny Leonidovich; Boiko, Valery Ivanovich; Nikolaev, Peter Ivanovich; Melnikov, Innokenty Alexandrovich; Eremin, Vladimir Alexandrovich; Revazov, Vyacheslav Georgievich; Jurievich, Jury Iosifovich; and Losev, Gennady Evgenievich, 3,815,879.

Lotgering, Frederik Karel; Beekmans, Nicolaas Marinus; Van Der Steen, Gerardus Henricus Antonius Maria; and Heigne, Leopold, to U.S. Philips Corporation. Electrochemical cell comprising a solid electrolyte. 3,816,179, Cl. 136-83.00r.

Loureiro, Valentin R.; and Greenberg, Abraham. Spray dried alpha-olephin sulfonate detergent compositions. 3,816,352, Cl. 252-556.000.

Love, James H.: *See—*
Rosenbaum, Barry M.; Tegge, Bruce R.; Faure, Jacques; and Love, James H., 3,816,379.

Love, Richard F.: *See—*
Duranleau, Roger G.; and Love, Richard F., 3,816,410.
Kablaoui, Mahmoud S.; Love, Richard F.; and Duranleau, Roger G., 3,816,404.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*

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Low, Hans: *See*—
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Low, William Wayne: *See*—
Bruen, Charles Patrick; Low, William Wayne; and Smalley, Edmund Walter, 3,816,095.
Low, William Wayne; Frick, Douglas Gene; and Gancy, Alan Brian, to Allied Chemical Corporation. Method for the conversion of chromite ore to sodium chromate. 3,816,094, Cl. 75-3.000.
Lowaw, David D. Horse walker. 3,815,551, Cl. 119-29.000.
Lowell, Rudolph L.: *See*—
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Lowry, Earl: *See*—
Foulks, Noah E.; and Lowry, Earl, 3,815,399.
Lubicz, George S.; and Bills, Alan J., to Xerox Corporation. Glow discharge technique for the preparation of electrophotographic plates. 3,816,288, Cl. 204-164.000.
Lubricating device: *See*—
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Lubrizol Corporation, The: *See*—
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Miller, Leonard Edward; and Hayashi, Katsumi, 3,816,370.
Lucas Aerospace Limited: *See*—
Lewis, Geoffrey Arthur; and Bloom, Joseph Louis, 3,816,021.
Lucas, Joseph, (Industries) Limited: *See*—
Thornley, Derek, 3,816,678.
Luceri, Joseph A. Apparatus and method for inverting and pressing reversible necktie. 3,815,796, Cl. 223-82.000.
Luckenbill, Lawrence F., to Mueller Co. Joint for smooth end or flareless pipe. 3,815,940, Cl. 285-105.000.
Ludwig, Gary J.; and Wood, Loren E., to Black, Sivalls & Bryson, Inc. Safety pressure relief device. 3,815,779, Cl. 220-89.00a.
Ludwig, Martin, to Siemens Aktiengesellschaft. Teleprinter having a type cylinder which is adjustable by means of a stepping motor. 3,816,656, Cl. 178-34.000.
Lugli, Gabriele; and Brandi, Bebriella, to Snam Progetti, S.p.A. Uranium compleses and process for preparing same. 3,816,372, Cl. 260-429.100.
Lugo, Luigi: *See*—
Reni, Cesare; Lugo, Luigi; and Gualdi, Giorgio, 3,816,554.
Luh, Donald Richard, to Du Pont de Nemours, E. I., and Company. Semiconductive elastomeric composition of chlorinated or chlorosulfonated polyethylene, ethylene polymer and conductive carbon black. 3,816,347, Cl. 252-511.000.
Luk Lamellen und Kupplungsbau GmbH: *See*—
Maucher, Paul, 3,815,715.
Lummus Company, The: *See*—
Kafer, Nicholas, 3,816,599.
Lund, Harold E.; and Ericson, John F. E., to Marvel Industries, Inc. Drum handling device. 3,815,767, Cl. 214-383.000.
Lundin, Robert S., to General Time Corporation. Bistable electromechanical transducer. 3,816,779, Cl. 310-37.000.
Lunenschloss, Edward V.; and Ford, Anthony R., to Airpax Electronics Incorporated. Snap action switch. 3,816,681, Cl. 200-67.0db.
Lunt, William G.: *See*—
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Lupo, Fritz J.; and Brining, Douglas E., to Feedmatic-Detroit, Inc. Orienting feed machanism. 3,815,731, Cl. 198-33.00r.
Lusby, Walter S., to Westinghouse Electric Corporation. Platable foamed rodent control material. 3,816,610, Cl. 424-17.000.
Lyman, Hugh M., Jr., to Granite Mill & Fixture Co. Portable cabinet. 3,815,966, Cl. 312-250.000.
Lynch, Donald Murl: *See*—
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Lynch, John Andrew, Jr.: *See*—
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Lynn, Charles L., Jr. Electrical circuit status indicator apparatus. 3,816,827, Cl. 340-381.000.
Lynn, Robert W. Fire control mechanism for firearms. 3,815,271, Cl. 42-84.000.
Lyszczek, Stephen W. Adjustable glass stake. 3,815,755, Cl. 211-41.000.
M & T Chemicals Inc.: *See*—
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Seltzer, Raymond, 3,816,441.
Mac Beth, James B., to I-T-E Imperial Corporation. Two-pressure circuit breaker with contact cooling by the direct expansion of high-pressure dielectric gas. 3,816,682, Cl. 200-148.00b.
Macall, Thomas F., to Midland Capital Corporation, mesne. Infrared scanning system. 3,816,741, Cl. 250-347.000.
Macander, Rudy (Rudolph) F.: *See*—
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MacArthur, Donald Morley; and Skurkiss, Peter Kenny, to Bell Telephone Laboratories, Incorporated. Gold etchant. 3,816,317, Cl. 252-79.500.
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Machanian, William V.; and Wheelwright, Robert W., to Wurlitzer Company, The. Money receiving and credit accumulator system. 3,815,720, Cl. 194-15.000.
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Mack, William S. Hobby kit for sculpturing. 3,815,264, Cl. 35-26.000.
Mackay, Patrick W.: *See*—
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Mackiw, Vladimir N.; Weir, Donald R.; Evans, David J. I.; and Maschmeyer, Dennis G., to Gordon, Sherritt, Mines Limited. Production of nickel powder from impure nickel compounds. 3,816,098, Cl. 75-.50a.
Mackrle, Svatopluk; and Mackrle, Vladimir, to Ceskoslovenska akademie ved. Arrangement for continuous treatment of polluted liquids. 3,815,750, Cl. 210-202.000.
Mackrle, Vladimir: *See*—
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MacMillan, Robert E., to McCord Corporation. Gas cap assembly. 3,815,776, Cl. 220-39.00r.
Macovski, Albert. Focused sonic imaging system. 3,815,409, Cl. 73-67.900.
Madachy, John F.: *See*—
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Madachy, John F., to Loopco Industries, Inc. Expansible winding drum assembly. 3,815,839, Cl. 242-72.000.
MADAG Maschinen- und Apparatebau Dietikon AG: *See*—
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Maeda, Akitoshi: *See*—
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Makbec, Edouard. Peristaltic pump. 3,816,035, Cl. 417-477.000.
Maki, Yoshiyuki; Fujita, Masaru; Takahashi, Hideo; and Ino, Tetsuo, to Hitachi, Ltd. and Tokyo Electric Power Co., The. Alkaline storage battery having zinc electrode. 3,816,178, Cl. 136-30.000.
Malafosse, Jean, to L'Air Liquide, Societe Anonyme pour l'Etude et. Process for the preparation of alkaline hyperoxide. 3,816,604, Cl. 423-581.000.
Malavazos, Arthur J. Manufacture of fluidic elements. 3,815,199, Cl. 29-157.00r.
Malec, Robert E., to Ethyl Corporation. Stable phosphate esters. 3,816,311, Cl. 252-46.700.
Malek, Walter K.; and Substelny, Henry, to Architectural Molded Products Ltd., mesne. Overhead garage door sections. 3,815,657, Cl. 160-229.000.
Malhota, Umesh Kumar: *See*—
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Manber, Solomon, to Redactron Corporation. Character display system with tabbing function. 3,816,823, Cl. 340-324.0ad.
Mandals Reberbane Christiansen & Co. A/S: *See*—
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Manini, Giuseppe. Device for operating hinged closures. 3,815,361, Cl. 60-477.000.
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Maricle, Donald Leonard; and Rauhut, Michael McKay, to American Cyanamid Company. Method for providing electroluminescent light

from a polycyclic heterocyclic compound in an aprotic solvent under electric current. 3,816,795, Cl. 315-246.000.

Marietta, Cesar, to Anciens Etablissments Leon Guilbert & Fils. . 3,816,065, Cl. Gas torches.

Marinace, John Carter, to International Business Machines Corporation. Durable see-through photoresist mask. 3,815,978, Cl. 350-311.000.

Maringer, Albert, to Siemens Aktiengesellschaft. Circuit for correcting the influence of velocity on an inductive position transducer. 3,816,781, Cl. 310-68.00r.

Marion, Charles P., to Texaco Development Corporation. Synthesis gas production. 3,816,332, Cl. 252-373.000.

Marks, Robert Elliott, to Envirotech Corporation. Recovery of terpenes. 3,816,239, Cl. 162-15.000.

Marks, Walter J., to Anchor Cap & Closure Corporation of Canada, Limited. Linerless closure cap. 3,815,771, Cl. 215-344.000.

Marlar, James Russ. Arrangement for producing openings in sheet metal beams for attaching fixtures or the like. 3,815,235, Cl. 30-363.000.

Marleau, Gilles E. Collapsible, triangular net assembly. 3,815,272, Cl. 43-12.000.

Maronde, Herbert; and Schmidt, Hans Dietrich, to Robot Foto und Electronic GmbH & Co. KG. Device for the automatic stop setting of photographic cameras. 3,816,841, Cl. 354-42.000.

Marplex Products Company, Inc.: *See—*
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Marrie, Paul, to Societe Etud. Automatic can opener with can disengagement through motor reversal. 3,815,226, Cl. 30-4.00r.

Marsh, Gale D.: *See—*
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Marshall, Preston F., to Kendall Company, The. Reinforced nonwoven fabrics. 3,816,231, Cl. 161-141.000.

Marshall, Richard A., to GTE Automatic Electric Laboratories, Incorporated. Line card circuit for a key telephone system. 3,816,670, Cl. 179-99.000.

Marshall, Thomas E., III; and von Wald, Walter A., Jr., to United States of America, Navy. Anemometer wind direction damping system. 3,815,413, Cl. 73-188.000.

Marshall, William James: *See—*
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Marston, William T.: *See—*
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Martfay, Ernst; and Rohrer-Spichtig, Karl, to Jozsef Balogh. Apparatus for recording the closure bite position of the jaw of a patient and the jaw articulation movement during biting together. 3,815,242, Cl. 32-32.000.

Martin, Duane P. Duct frame opening. 3,815,638, Cl. 138-103.000.

Martin, Eugene D. Trash bag retainer. 3,815,778, Cl. 200-65.000.

Martin, Jerry Roy: *See—*
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Tadanier, John Soloman; and Martin, Jerry Roy, 3,816,398.

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Martinez, Enrique R.: *See—*
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Martiros, Paul, to American Optical Corporation. Method for making one-piece multifocal lenses. 3,815,294, Cl. 51-284.000.

Marvel Industries, Inc.: *See—*
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Marx, Arthur Friedrich. 1a, 2a-Methylene-androstane derivatives. 3,816,405, Cl. 260-239.500.

Mas, Joseph A. Method and apparatus for charging batteries. 3,816,806, Cl. 320-20.000.

Masaki, Tatsuo: *See—*
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Massachusetts Institute of Technology: *See—*
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Massie, Stephen N., to Universal Oil Products Company. Process for preparing unsymmetrically substituted dibasic acids. 3,816,510, Cl. 260-482.00r.

Mast, Aquila D.; and Eggers, Edward T., to Sperry Rand Corporation. Hay roll forming machine. 3,815,345, Cl. 56-341.000.

Masuda, Noboru; Kuroyanagi, Masasi; and Matukawa, Takashi, to Denki Onkyo Co., Ltd. Keyboard switch apparatus. 3,816,826, Cl. 340-365.00e.

Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vencent, Peter Incledon. Thermoplastic compositions. 3,816,563, Cl. 260-876.00r.

Matisoo, Juri: *See—*
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Matsubara, Mitsuteru: *See—*
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Matsuoka, Masaru: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matt, Richard J.; and Rolland, Thomas P., to Textron Inc. Braided fabric bearing liner. 3,815,468, Cl. 87-1.000.

Mattes, Lorenz. Collet. 3,815,930, Cl. 279-50.000.

Mattoon, Roland W. Stuffing box assembly. 3,815,925, Cl. 277-2.000.

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Maurelli, Manlio: *See—*
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Maurey, Joseph E.; and Campbell, James D., to Maurey Manufacturing Corporation. Adjustable pulley. 3,815,432, Cl. 74-230.17b.

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Mauser Kommanditgesellschaft: *See—*
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Mawhinney, Robert C., to MB Associates. Lethal expandible projectile. 3,815,502, Cl. 102-42.00c.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften ev: *See—*
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May, John E., Jr.: *See—*
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May, Richard W. Machine mount apparatus and method for limiting motion of a heavy machine. 3,815,852, Cl. 248-24.000.

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Mayer, Johann: *See—*
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Mayr, Helmut; Pelte, Richard; and Huber, Theodor, to Agfa-Gevaert Aktiengesellschaft. Motion picture camera with manually and automatically adjustable diaphragm. 3,815,984, Cl. 351-141.000.

Mazal, Charles N. Endotracheal catheter. 3,815,606, Cl. 128-351.000.

Mazur, Edward, to A.D.A. Machine Corporation. Carton sealer. 3,816,220, Cl. 156-486.000.

Mazzagarri, Roy P.: *See—*
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M.B.K. International Ltd.: *See—*
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McAdam, Will, to Leeds & Northrup Company. Thermocouple with insulation piercing junction means. 3,816,182, Cl. 136-230.000.

McAninch, Herbert A.; and Mieras, Spencer H., to Borg Warner Corporation. Differential mechanism. 3,815,442, Cl. 74-711.000.

McAninch, Herbert A.; and Mieras, Spencer H., to Borg Warner Corporation. Differential mechanism. 3,815,443, Cl. 74-711.000.

McCaffrey, Michael Thomas; and Castellano, Joseph Anthony, to RCA Corporation. Novel electro-optic devices. 3,816,336, Cl. 252-408.000.

McCallum, James B., to Itek Corporation. Slurry dispensing apparatus having vacuum controlled discharge. 3,815,786, Cl. 222-70.000.

McCann, James J., to Xerox Corporation. Echo check circuit. 3,816,727, Cl. 235-153.0as.

McCann, Milton H., to Riker Laboratories, Inc. Tube annealing apparatus and method. 3,815,881, Cl. 266-5.000.

McClain, Lamont R., to Engel Industries, Inc. Roll machine for alternate cleat forming. 3,815,398, Cl. 72-181.000.

McComber, Donald R.: *See—*
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McConnell, James: *See—*
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McCord Corporation: *See—*
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McCreery, James F., to Kennametal Inc. Arrangement for locating cutting insert in holder. 3,815,195, Cl. 29-96.000.

McCrickerd, John T.: *See—*
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McCullough, Charles E. Magnetic tape programming system for controlling multiple electrical appliances. 3,815,985, Cl. 353-15.000.

McDonnell Douglas Corporation: *See—*
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McDowell, John E., 1/2 to McDowell, Richard E. Rotary tool sanding attachment. 3,815,290, Cl. 51-170.0pt.

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McFarlin, Ralph M., to Esquire, Inc. Light fixtures. 3,815,857, Cl. 248-223.000.

McGoury, Thomas Elias: *See—*
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McGuire, Lindell V.; and Sparlin, Derry D., to Continental Oil Company. Method for fracturing and propping unconsolidated and dilatant subterranean formations. 3,815,680, Cl. 166-281.000.

McKay, Donald R.; Swinkels, Godefridus M.; and Szarmes, Kornel R. V., to Cominco Ltd. Hydrometallurgical process for extraction of copper and sulphur from copper iron sulphides. 3,816,105, Cl. 75-115.000.

McKenna, Paul F. Method of protectively capping and bonding thread portions securing a button to a garment. 3,816,200, Cl. 156-93.000.

McKenzie, Roland W.; and Stansberry, Richard. Door assembly for a refuse receiving hopper. 3,815,950, Cl. 296-56.000.

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Meier, Fran; Ossendorf, Erich; and Wolfgarten, Hubert, to Gutehoffnungshuette Sterkrade A.G. Centrifugal vapor-liquid separator. 3,815,339, Cl. 55-338.000.

Meier, Hans, to Sprecher & Schuh Aktiengesellschaft. Flat cable connectors. 3,816,818, Cl. 339-99.00r.

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Meiser, Kenneth D., to Plastics Manufacturing Company. Decorated molded article and mtehod of producing it. 3,816,232, Cl. 161-146.000.

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Melaja, Asko J., to Suomen Sokeri Osakeyhtio (Finnish Suger Company). Process for formation of crystalline fructose-glucose blends. 3,816,175, Cl. 127-60.000.

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Meredith, John A. Shoring system components. 3,815,369, Cl. 61-39.000.

Meri, Kalju, to Electrospace Corporation. Apparatus for detecting telephone ringing signals. 3,816,669, Cl. 179-84.00r.

Meri, Kalju, to Electrospace Corporation. Schmitt trigger circuit. 3,816,767, Cl. 307-288.000.

Merrien, Louis: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,815,793.

Merriweather, Kenneth A.: *See—*
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Merz, Herbert: *See—*
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Messrs. Schwan-Bleistift-Fabrik: *See—*
Kruckel, Peter Alexander, 3,815,734.

Meston, Spencer Davidson, to British Aircraft Corporation Limited. Apparatus for supporting a load. 3,815,849, Cl. 244-1.0ss.

Meszaros, Ronald E. Fletching unit for arrow. 3,815,916, Cl. 273-106.50c.

Metaframe Corporation: *See—*
Willinger, Allan H.; and Dinnerstein, Albert J., 3,815,547.

Metallo Gasket Co.: *See—*
Geipel, Stanley W., 3,815,927.

Metcalfe, Paul V. Adjustable escutscheon. 3,815,821, Cl. 239-37.000.

Method and circuit element for the selective changing of a semiconductor diffusion region: *See—*
Crowle, Brian, 3,816,769.

Metrailer, William J.: *See—*
Moser, John F., Jr.; and Metrailer, William J., 3,816,084.

Metzgar, Kenneth Joseph; and Tillou, Frank Macomb. Electrodymanic force generator. 3,816,777, Cl. 310-13.000.

Mexton Manufacturing Company: *See—*
Shrum, William M., 3,815,710.

Meyer, Alvin H. Snap-on adjustable sliding clip for shelf partitions. 3,815,519, Cl. 108-61.000.

Meyer, Robert B.: *See—*
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Meyer, Rudolf: *See—*
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Meywald, Klaus, to Eichenauer, Fritz. Heating member for a hair dryer. 3,816,706, Cl. 219-537.000.

Mezger, Hans: *See—*
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Mgeladze, Nodar Vladimirovich: *See—*
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Michel, Walter: *See—*
Krueger, Friedrich; Bauer, Lieselotte; and Michel, Walter, 3,816,517.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. Polyfluorinated poly vinyl isocyanates. 3,816,495, Cl. 260-453.0al.

Midland Capital Corporation, mesne: *See—*
Macall, Thomas F., 3,816,741.

Midland Manufacturing Corporation: *See—*
Portis, Ralph G., 3,815,416.
Midrex Corporation, mesne: *See—*
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Midway Manufacturing Company: *See—*
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Mieras, Spencer H.: *See—*
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McAninch, Herbert A.; and Mieras, Spencer H., 3,815,443.
Mihailovski, Alexander; and Pallos, Ferenc M. Herbicidal aryl acetylene ethers. 3,816,091, Cl. 71-124.000.
Mihailovski, Alexander; and Pallos, Ferenc M., to Stauffer Chemical Company. Aryl acetylene ethers. 3,816,541, Cl. 260-613.00d.
Mihara, Shigetoshi; Inaba, Yanosuke; Tachibana, Koichi; and Tomio, Endo, to Nakataki Pharm. Industry Co., Inc. Pocess for treatment of oil-containing seeds. 3,816,389, Cl. 260-123.500.
Mikhailov, Evgeny Leonidovich; Boiko, Valery Ivanovich; Nikolaev, Peter Ivanovich; Melnikov, Innokenty Alexandrovich; Eremin, Vladimir Alexandrovich; Revazov, Vyacheslav Georgievich; Jurievich, Jury Iosifovich; and Losev, Gennady Evgenievich. Device for strring and aerating liquids in mass-exchange apparatus. 3,815,879, Cl. 261-93.000.
Mikovits, John L.: *See—*
Scott, Ray A.; Bossard, Fredrick R.; Strang, Elmer J.; and Mikovits, John L., 3,815,653.
Mikulin, Tom T. Safety guard. 3,815,440, Cl. 74-612.000.
Mikumo, Masao: *See—*
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Miller, Charles G., to United States of America, National Aeronautics and Space Administration. Dispensing targets for ion beam particle generators. 3,816,785, Cl. 313-61.00s.
Miller, Charles H.: *See—*
06/11/74; and Miller, Charles H., 3,816,073.
Miller, Gordon H., to Texaco Inc. Trimerization of nitriles. 3,816,418, Cl. 260-248.0cs.
Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., to Sherwin-Williams Company, The, mesne. Jolt table shaped for supporting cope top and telescoping into drag. 3,815,662, Cl. 164-203.000.
Miller, Leonard Edward; and Hayashi, Katsumi, to Lubrizol Corporation, The. Acrylonitrile polymerization method and products thereof. 3,816,370, Cl. 260-79.3mu.
Miller, Paul Marcus, to Tangen Drivers, Inc. Parts orienter and feeder assembly. 3,815,782, Cl. 221-160.000.
Miller, Sol: *See—*
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Milleville, Bertram J.; Bake, Earl A.; and Lunt, William G., to Rockwell Manufacturing Company. Plug valve assemblies. 3,815,870, Cl. 251-309.000.
Mills, Winslow B. Method and apparatus for controlling the amount of moisture removed from material. 3,815,254, Cl. 34-31.000.
Milton, Arnold T.: *See—*
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Staub, Charles H., Jr., 3,815,592.
Minieri, Pasquale P., to Tenneco Chemicals, Inc. N'-Substituted indazoles. 3,816,447, Cl. 260-310.00c.
Minnesota Mining and Manufacturing Company: *See—*
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Croft, Thomas S.; and La Mar Zollinger, Joseph, 3,816,416.
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Minsker, Lawrence D. Portable folding chair. 3,815,952, Cl. 297-47.000.
Miscovich, John A., to Marcona Company. Eductor jet pump and method. 3,816,027, Cl. 417-184.000.
Mitarai, Hajime; Nelson, Carroll E.; and Youmans, Albert P., to Signetics Corporation. Semiconductor structure and method for lowering the collector resistance. 3,815,222, Cl. 29-578.000.
Mitchell, Philip A., to Kendall Company, The. Process for removing polymeric binders from nonwoven fabrics. 3,816,238, Cl. 162-8.000.
Mitchell, Robert S.: *See—*
King, Thomas M.; and Mitchell, Robert S., 3,816,333.
Mitsubishi Chemical Industries Ltd.: *See—*
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Mittendorf, Theodor H. Vehicle insect protection apparatus. 3,815,700, Cl. 180-68.00p.
Miya, Kenichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Coaxial cable including at least one repeater. 3,816,673, Cl. 179-170.00r.
Miyajima, Shin: *See—*
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Mockli, Rolf, to I-T-E Imperial Corporation. Gas blast synchronous breaker with gas biased contacts. 3,816,683, Cl. 200-148.00b.
Mocny, Richard C.; and Mueller, Francis B., to Waco Scaffold & Shoring Co., Division of Bliss & Laughlin Industries, Inc. Roll out formwork support. 3,815,858, Cl. 248-295.000.
Moesch, Rudolf: *See—*
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Mohler, Forrest N., to E-W Mold & Tool Co., Inc. Interlock actuating means for mold assembly. 3,816,047, Cl. 425-249.000.
Moir, Ralph W., to United States of America, Atomic Energy Commission. Plasma energy to electrical energy converter. 3,816,771, Cl. 310-5.000.
Molby, Lloyd A., to Le Tourneau, R. G., Inc. Adjustable ball pin pivot. 3,815,938, Cl. 280-461.00r.
Molins, Desmond Walter, to Molins Limited. Manufacture of cigarettes. 3,815,612, Cl. 131-94.000.
Molins Limited: *See—*
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Molins, Desmond Walter, 3,815,612.
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Mollod, Leonard D., to International Telephone and Telegraph Corporation. Noise-dithered hard-limit loran C/D receiver. 3,816,831, Cl. 343-103.000.
Molloy, Kenneth H.; Ward, John P.; and Benson, Mark, to Computer Systems Engineering, Inc. Traffic signal control system. 3,816,796, Cl. 315-287.000.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Camera lens system with means for correcting aberrations. 3,815,974, Cl. 350-217.000.
Monahan, William Harold, to Cameron-McIndoo Limited. Portable storage and carrying structure. 3,815,800, Cl. 224-45.00n.
Monroe, Donald G., to Active Garage Builders, Inc. Pre-fabricated facia. 3,815,302, Cl. 52-94.000.
Monsanto Company: *See—*
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Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., 3,816,489.
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Sulzbach, Reinhard A.; and Iqbal, Abul F. M., 3,816,439.
Taylor, Keith M., 3,816,506.
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Monte, Alexander A.; and Chiang, Ching, to Mallinckrodt Chemical Works. Reagent formulations for assaying biological specimens and methods of preparing and using same. 3,816,262, Cl. 195-100.000.

Montecatini Edison S.p.A.: *See*—
Rinaldi, Francesco; Alberti, Ferruccio; and Aguzzi, Paolo, 3,816,592.

Montgomery, John: *See*—
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Montoya, Margarito F.; and Carrilo, Peter F. Coin operated security lock rack for bicycles. 3,815,721, Cl. 194-40.000.

Moore Business Forms, Inc.: *See*—
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Moore, Earl K., Jr. Broaching tool. 3,815,193, Cl. 29-95.100.

Moore, James Melvin; Newell, William Gilbert; Hampton, Anthony Everette; and Jackson, Philip Elmo, to Fieldcrest Mills, Inc. Method and apparatus for making space-dyed yarns. 3,815,179, Cl. 19-163.000.

Moore, Lee C., Corporation: *See*—
Woolslayer, Homer J., 3,815,757.

Moore, Robert S., to Eastman Kodak Company. Method of making a plastic optical element. 3,816,160, Cl. 117-33.300.

Mooring, Scott W., to Steamatic, Inc. Apparatus for dry cleaning of fabrics in situ. 3,815,169, Cl. 15-321.000.

Moran, Francis; and Myers, Philip Albert, to British Petroleum Company, The. Process for the production of micro-organisms. 3,816,252, Cl. 195-28.00r.

Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, to L'Oreal. Pressurized dispenser holding more highly pressurized internal container. 3,815,793, Cl. 222-399.000.

Morduchowitz, Abraham; and Rubin, Isaac D., to Texaco Inc. Mineral oil compositions. 3,816,315, Cl. 252-51.50a.

Morell, Josef; Nowak, Johann; Schild, Josef; and Wessner, Harald, to Vockenhuber, Karl and Hauser, Raimund. Recording or reproducing apparatus. 3,815,847, Cl. 242-191.000.

Morgason, Linda L.: *See*—
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Mori, Takao: *See*—
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Morimoto, Yoshiro; and Suzuki, Kunihiko, to Nissan Motor Company, Limited. Automotive transmission gear shifting mechanism. 3,815,436, Cl. 74-476.000.

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Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; Naruke, Takeshi; Fumihiko, Morinaga; and Takeshi, Naruke, 3,816,629.

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Morita, Eiichi, to Monsanto Company. Treating rubber to enhance fiber bonding. 3,816,361, Cl. 260-3.000.

Morita, Yoshiharu; Kikumoto, Ryoji; Ohba, Hiroshi; Nakamura, Akio; Fukuda, Kaoru; and Nomura, Tatsuo, to Mitsubishi Chemical Industries Ltd. Process for preparing 2-substituted-3,4-dihydro-2H-pyrans. 3,816,465, Cl. 260-345.100.

Morris, Arthur; and Thomas, Hugh, to Imperial Chemical Industries Limited. Transition metal compositions. 3,816,340, Cl. 252-430.000.

Morris, Donald E.: *See*—
Forster, Denis; and Morris, Donald E., 3,816,490.

Morris, Leo R., to Dow Chemical Company, The. (Polyhaloalkyl) vinylbenzonitrile compounds. 3,816,504, Cl. 260-465.00g.

Morrison, Howard J.; and Glass, Marvin I., to Glass, Marvin, & Associates. Animated riding toy. 3,815,931, Cl. 280-1.201.

Morrison, Thompson, to NKM Corporation. Air circulation diffuser system. 3,815,486, Cl. 98-40.00d.

Morry, Bernard H.: *See*—
Lavitch, Bernard R.; and Morry, Bernard H., 3,815,798.

Mortensen, Peter Eli, to Carlton Company. Article orienting apparatus. 3,815,729, Cl. 198-33.0aa.

Moser, John F., Jr.; and Metrailer, William J., to Esso Research and Engineering Company. Cokeless coker with recycle of coke from gasifier to heater. 3,816,084, Cl. 48-206.000.

Moser, Raymond L.; and Stedman, Robert N., to Caterpillar Tractor Co. Material transport. 3,815,765, Cl. 214-82.000.

Moslo, Ernest P. Method for blow molding hollow articles. 3,816,579, Cl. 264-97.000.

Moss, Charles H.: *See*—
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Moss, William A. Emission control muffler means and method. 3,815,328, Cl. 55-93.000.

Motegi, Shoji: *See*—
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Motor Wheel Corporation: *See*—
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Mott, George E., to Texaco Inc. Marine structure. 3,815,372, Cl. 61-46.500.

Moulton, Alexander Eric; Uncles, Philip Basil; Slade, John Derek; and Taylor, Kenneth John, to Moulton Developments Limited. Pressure vessels. 3,815,885, Cl. 267-65.000.

Moulton Developments Limited: *See*—
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Mrowca, Joseph J., to Du Pont de Nemours, E. I., and Company. Organophosphorus compounds containing N-bonded pyrrole groups. 3,816,452, Cl. 260-326.610.

Mudde, John P., to CPC International Inc. Vapor permeable compositions. 3,816,170, Cl. 117-161.000.

Mueller Co.: *See*—
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Mueller, Francis B.: *See*—
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Mueller, Karl, to Ciba-Geigy A.G., mesne. Pulverized polymer solution or dispersion, a polymer powder, a process of production thereof and a powder coating technique. 3,816,442, Cl. 260-30.200.

Muirhead, Hugh J.: *See*—
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Muller, Frank; Lohringer, Werner; Milles, Karl; Brauling, Herman; and Prigge, Helmut, to Consortium fur Elektrochemische Industrie G.m.b.H. Ketoximecarbamate pesticides. 3,816,532, Cl. 260-566.0ac.

Muller, Georges: *See*—
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Mullins, John W. Copper tube service valve. 3,815,624, Cl. 137-318.000.

Mullins, Lynn D.: *See*—
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Munnekehoff, Gerd; and Busch, Hansjochen, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Sleeve chuck for thread winding device. 3,815,836, Cl. 242-46.400.

Murakami, Keiichi: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Ito, Humio, 3,816,575.

Murata, Katsuhide; Takahataka, Masaharu; Kakutani, Kazuo; and Uedono, Sigezo, to Mitsui Shipbuilding and Engineering Co., Ltd. Process for producing microbial protein from hydrocarbon. 3,816,256, Cl. 195-30.000.

Murgo, Felice F., to M.B.K. International Ltd. Cleaning machine. 3,815,387, Cl. 68-23.300.

Murphy, Gregory I. Stereo attachment accessory for cameras. 3,815,970, Cl. 350-130.000.

Murphy, Preston V.: *See*—
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Murphy, Thomas J. Sharpening apparatus for circular saw blades. 3,815,446, Cl. 76-43.000.

Murray, William B., to Sportcraft, Inc. Aerated bait container. 3,815,277, Cl. 43-57.000.

Myers, Philip Albert: *See*—
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N L Industries, Inc.: *See*—
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N. V. Industrieele Handelscombinatie: *See*—
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Nagai, Yohei, to Nippon Gakki Seizo Kabushiki Kaisha. Tremolo generating device having sound reflecting rotary member. 3,815,706, Cl. 181-31.00b.

Nagao, Hiroyuki, to Nippon Electric Company, Limited. Light-sensible semiconductor device. 3,816,847, Cl. 357-17.000.

Nagasawa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; Obayashi, Tomokazu; and Mizota, Teruhiko, to Morinaga Milk Industry Co., Ltd. Process for preparing a lactulose syrup. 3,816,174, Cl. 127-42.000.

Nagaswa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; and Mizota, Teruhiko, to Morinaga Milk Industry Co., Ltd. Process for preparing a lactulose powder by utilizing protein. 3,816,394, Cl. 260-209.00r.

Nagata, Wataru; and Hayase, Yoshio, to Shionogi & Co., Ltd. Process for preparing enamine phosphorus compounds. 3,816,570, Cl. 260-968.000.

Nagayoshi, Akio; and Morii, Kenji, to Mitsubishi Petrochemical Company Limited and UC Sangyo Company Limited. Process for preparing mats having cushion. 3,816,204, Cl. 156-167.000.

Naguib, Monir: *See*—
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Nakade, Kazuhiko: *See*—
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Nakamura, Shinichi: *See*—
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Nakamura, Tadahiko, to Sony Corporation and Data Input device. . 3,816,770, Cl. 307-308.000.

Nakamura, Toshio; Sakauma, Yasuzi; Egawa, Hitoshi; Kawai, Sadaharu; and Motegi, Shoji, to Hitachi, Ltd. Compound spring ar-

rangement for brush holders of ratary electric machines. 3,816,783, Cl. 310s246.000.
Nakataki Pharm. Industry Co., Inc.: *See—*
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Nakatani, Seiji: *See—*
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Nakayama, Kiyoshi; Furuya, Akira; and Ukita, Masayo, to Kyowa Hakko Kogyo Co., Ltd. Process for producing adenosine-3,5-cyclic menophosphoric acid by fermentation. 3,816,251, Cl. 195-28.00n.
Nalco Chemical Company: *See—*
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Nantau, Wayne E.; and Pollock, Samuel C., to General Motors Corporation. Vehicle body retractable top. 3,815,951, Cl. 296-137.00f.
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger Dieter, to Squibb, E. R., & Sons, Inc. o-Acylamino-N-(2-thiazolin-2-yl and 2-thiazin-2-yl) anilines and derivatives thereof. 3,816,414, Cl. 260-240.00j.
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger D., to Squibb, E. R., & Sons, Inc. Thiazolinyl derivatives of o-phenylenediamines. 3,816,444, Cl. 260-306.700.
Narisawa, Shizuo: *See—*
Yagi, Yoshiharu; Sato, Hiroshi; Narisawa, Shizuo; Yasui, Seimei; Kogayashi, Akiro; Hino, Minoru; and Hata, Kazuhiko, 3,816,567.
Naruke, Takeshi: *See—*
Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; Naruke, Takeshi; Fumihiko, Morinaga; and Takeshi, Naruke, 3,816,629.
Nashua Corporation: *See—*
Davis, Austin E.; and Agostino, Peter A., 3,815,989.
Laclair, Albert W., 3,816,139.
National Cash Register Company, The: *See—*
Brown, George T., Jr.; Clark, Donald B.; and Bayless, Robert G., 3,816,331.
Churchill, Donald; and Cartmell, James V., 3,816,786.
National Gypsum Company: *See—*
Dawdy, Jack A.; and Winkowski, Daniel A., 3,816,199.
National Petro-Chemicals Corporation, mesne: *See—*
Stotko, Norbert Anthony, 3,816,383.
National Research Development Corporation: *See—*
Butters, John Neil; and Leendertz, Jack Albert, 3,816,649.
Skorecki, Jan; and Wheble, Victor Henry, 3,815,157.
National Steel Corporation: *See—*
Austin, Lowell W.; Beale, Louis C., Jr.; and Smith, Edwin J., 3,816,082.
National Teaching Aids, Inc.: *See—*
Oberwager, Jerome, 3,815,263.
National Union Electric Corporation: *See—*
Brooks, Joseph F.; and Meyer, Robert B., 3,815,170.
Nauman, Edward F.: *See—*
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,816,169.
Nazareth, Alfred, Jr.: *See—*
Slawson, Richard S.; and Nazareth, Alfred, Jr., 3,816,760.
N.C. automatic folding machine: *See—*
Daniels, Dennis, 3,815,393.
Neal, Duward Harding, to Tred-X Corporation. Replacement tread and method. 3,815,651, Cl. 152-187.000.
Neale, Ronald G., to Energy Conversion Devices, Inc. Film deposited semiconductor devices. 3,816,197, Cl. 156-8.000.
Neckermann, Edwin F.; and Hammer, James A., to Beatrice Foods Co. Method of deodorizing animal waste with cherry pit extracts. 3,816,577, Cl. 424-76.000.
Nelson, Carroll E.: *See—*
Mitarai, Hajime; Nelson, Carroll E.; and Youmans, Albert P., 3,815,222.
Nelson, Leon Franklin, to Deere & Company. Harvester pickup. 3,815,346, Cl. 56-364.000.
Nelson, Ronald E.: *See—*
Anderson, Ralph B.; and Nelson, Ronald E., 3,815,501.
Nelson, Theodore C.; and Cummings, Arthur Truman. Cutter heads for lawn trimmers and edgers and woodcarving tools. 3,815,234, Cl. 30-347.000.
Nelson, Victor R. Articulated conveyor. 3,815,482, Cl. 93-36.00r.
Nemec, Jiri; Bures, Ladislav; and Rajnoha, Jaroslav, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Apparatus for splicing a yarn with newly spun yarn in open end spinning. 3,815,347, Cl. 57-34.00r.
Nephew, Oliver T., to FMC Corporation. Boom extension control system. 3,815,760, Cl. 212-55.000.
Nero, Leroy W.; and Merriweather, Kenneth A., to Warwick Electronics, Inc. Hue correction system. 3,816,846, Cl. 358-28.000.
Neubeck, Clifford E.: *See—*
Collinge, Alfred E.; Neubeck, Clifford E.; and Udinsky, John R., 3,816,259.
Neuroth, Charles George: *See—*
Pepe, Anthony Enrico; Legnick, Guenther Fritz; and Neuroth, Charles George, 3,816,164.
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Gotham, Robert W.; McKnight, Robert J.; and Neuwirth, Frank J., 3,815,196.
New Hudson Corporation: *See—*
Sukenik, Robert J., 3,815,197.
New York Wire Mills Corporation: *See—*
Henry, Mort W., 3,815,642.
Newcomb, Harley M.; Sparer, Seno; and Abrahamson, Robert K., to Apeco Corporation. High speed copy machine. 3,815,990, Cl. 355-13.000.
Newcor, Inc.: *See—*
Derdowski, Ronald A.; Hayner, Don S.; and Parker, Frank S., 3,816,697.
Newell, William Gilbert: *See—*
Moore, James Melvin; Newell, William Gilbert; Hampton, Anthony Everette; and Jackson, Philip Elmo, 3,815,179.
Newman, Joseph L.: *See—*
O'Connor, John L.; and Newman, Joseph L., 3,815,663.
Newman, Nicholas S., to Kendall Company, The. Process for applying an aqueous dispersion of short, binder coated fibers to a drylaid nonwoven fabric. 3,816,159, Cl. 117-28.000.
Nguyen-Duc, Xuong, to Institut Francaise du Petrole, des Carburants et Lubrifiants. Floating installation. 3,815,536, Cl. 114-.50d.
Nichol, Thomas W.; and Schmidt, Richard J. Flammable fluid container security device. 3,815,388, Cl. 70-63.000.
Nicolet Instrument Corporation: *See—*
Schumann, Robert W., 3,816,815.
Nield, Eric: *See—*
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vencent, Peter Incledon, 3,816,563.
Nielsen, Harold R.; and Hagenson, Leo J., to Foldcraft Company. Automatic press. 3,816,044, Cl. 425-157.000.
Nielsen, Ole Bent Tvaermose: *See—*
Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, 3,816,482.
Niemi, William B., to Package Machinery Company. Neck ring mechanism for plastic injection blow molding machine. 3,816,050, Cl. 425-387.00b.
Nikoden, Joseph, Jr., to Detroit Bullet Trap Corporation. Shooting range ceiling protection device. 3,815,520, Cl. 109-49.500.
Nikoden, Joseph, Jr., to Detroit Bullet Trap Corporation. Shooting target holder. 3,815,914, Cl. 273-102.00s.
Nikolaev, Peter Ivanovich: *See—*
Mikhailov, Evgeny Leonidovich; Boiko, Valery Ivanovich; Nikolaev, Peter Ivanovich; Melnikov, Innokenty Alexandrovich; Eremin, Vladimir Alexandrovich; Revazov, Vyacheslav Georgievich; Jurievich, Jury Iosifovich; and Losev, Gennady Evgenievich, 3,815,879.
Nippon Electric Company, Limited: *See—*
Kaneko, Haruo; Katagiri, Yoshio; and Okada, Tomonori, 3,816,825.
Nagao, Hiroyuki, 3,816,847.
Otsuka, Hiroaki; Manabe, Norihisa; and Konishi, Tatsuo, 3,816,850.
Sakoe, Hiroaki; and Chiba, Seibi, 3,816,722.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nagai, Yohei, 3,815,706.
Nippon Gukki Seizo Kabushiki Kaisha: *See—*
Hashimoto, Osamu; and Takabayashi, Yoshikazu, 3,816,573.
Nippon Hoso Kyokai: *See—*
Otsuka, Hiroaki; Manabe, Norihisa; and Konishi, Tatsuo, 3,816,850.
Nippon Kokan Kabushiki Kaisha: *See—*
Matsumura, Yutaka; Nishifuji, Katsuyuki; Watanabe, Katsunori; and Matsuura, Kenji, 3,815,408.
Sekine, Kazuo; Mimura, Michio; and Oniki, Yasuhiko, 3,815,884.
Nippon Telegraph and Telephone Public Corporation: *See—*
Takagi, Toru; Ochi, Osamu; and Mizushima, Yoshihiko, 3,816,108.
Nippondenso Co., Ltd.: *See—*
Suda, Toshi; Akashi, Tetsuji; and Dohshita, Hidetoshi, 3,815,564.
Nippondenso Kabushiki Kaisha: *See—*
Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, 3,816,717.
Nishifuji, Katsuyuki: *See—*
Matsumura, Yutaka; Nishifuji, Katsuyuki; Watanabe, Katsunori; and Matsuura, Kenji, 3,815,408.
Nishimura, Kotaro: *See—*
Usami, Seiji; Nishimura, Kotaro; and Fukushi, Saburo, 3,816,337.
Nishiyama, Akira; Yoshino, Hirokazu; Yamaguchi, Tetsuo; Tsuboka, Eiichi; and Ohwaki, Haruki, to Matsushita Electric Industrial Co., Ltd. Speech synthesizer with glide control. 3,816,660, Cl. 179-1.0sa.
Niskin, Shale J. Multi-capacity water sampler. 3,815,422, Cl. 73-425.40r.
Nissan Motor Company, Limited: *See—*
Hiraiwa, Kazuyoshi, 3,815,714.
Morimoto, Yoshiro; and Suzuki, Kunihiko, 3,815,436.
Nisula, Ero V.; and Nisula, Waino W. Interlocking, serially interconnecting, extruded building block modules for walls, floors, ceilings. 3,815,311, Cl. 52-579.000.
Nisula, Waino W.: *See—*
Nisula, Ero V.; and Nisula, Waino W., 3,815,311.
Nitzsche, Siegfried; Strasser, Rudolf; Leser, Robert; and Helmut, Spork, to Wacker Chemie GmbH. Process for preparing organopolysiloxane oils. 3,816,493, Cl. 260-448.0ze.
N.K. Verwaltungs AG: *See—*
Agidius, Paul Erik, 3,815,424.
NKM Corporation: *See—*
Morrison, Thompson, 3,815,486.
NL Industries, Inc.: *See—*
Hoffman, George W.; and Granquist, William T., 3,816,343.
Nockleby, Raymond B. Pipe gripping tool. 3,815,450, Cl. 81-111.000.

Noga, Robert A., to Rohr Industries, Inc. Roller cam latch for window. 3,815,944, Cl. 292-261.000.

Noguchi, Takeshi: *See—*
Tsuchihara, Toyoji; Yawaka, Youhei; and Noguchi, Takeshi, 3,816,362.

Noll, Thomas K.; and Billingsley, Robert E., to Magnavox Company, The. Scene intrusion alarm. 3,816,648, Cl. 178-6.800.

Nomura, Tatsuo: *See—*
Morita, Yoshiharu; Kikumoto, Ryoji; Ohba, Hiroshi; Nakamura, Akio; Fukuda, Kaoru; and Nomura, Tatsuo, 3,816,465.

Nordiska Maskinfilt Aktiebolaget: *See—*
Codorniu, Francisco Lorente, 3,815,645.

Nordsiek, Karl-Heinz; and Streck, Poland, to Chemische Werke Huls Aktiengesellschaft. Vulcanizable rubber mixtures. 3,816,358, Cl. 260-4.00r.

Nordson Corporation: *See—*
Horvath, Richard A.; Stumphauzer, William C.; Hogstrom, Edwin F.; and Rood, Alvin A., 3,816,165.
Reighard, Alan B.; and Tamny, Simon Z., 3,815,788.
Rood, Alvin A.; Hogstrom, Edwin F.; and Stumphauzer, William C., 3,815,544.

Norman, George J.; and Reader, Kenneth R., to United States of America, Navy. Cam type air control valves. 3,816,019, Cl. 416-20.000.

North, Arthur J. Exposure controlled corona device. 3,816,749, Cl. 250-324.000.

Northrop Corporation: *See—*
Chang, Milton M. T.; and McCrickerd, John T., 3,816,647.

Norvitch, Ralph F. Box and various length rods having length indicia. 3,815,918, Cl. 273-130.00r.

Nott, Frank Joseph, to Production Equipment Limited. Conveyor belt idler assembly. 3,815,724, Cl. 198-192.00r.

Novello, Frederick C., to Merck & Co., Inc. Method for lowering uric acid levels using 7-alkyl-sulfonyl substituted benzothiadiazine-1,1-dioxides. 3,816,625, Cl. 424-246.000.

Novello, Frederick C., to Merck & Co., Inc. 3-Pyridyl-1,2,4-benzothiadiazine-1,1-dioxide for lowering uric acid levels. 3,816,626, Cl. 424-246.000.

Novello, Frederick C., to Merck & Co., Inc. 6-Sulfamoyl-7-substituted-4(3H)-quinazolinones for decreasing uric acid concentration. 3,816,631, Cl. 424-251.000.

Nowak, Bernard E.: *See—*
Economy, James; Cottis, Steve G.; and Nowak, Bernard E., 3,816,417.

Nowak, Johann: *See—*
Morell, Josef; Nowak, Johann; Schild, Josef; and Wessner, Harald, 3,815,847.

Nugent, Adam, Jr.: *See—*
Baker, Ralph W.; Bergeron, Charles R.; and Nugent, Adam, Jr., 3,816,608.

N.V. Industrieele Handelscombinatie Holland: *See—*
Peereboom, Hans, 3,815,540.

Nygren, Charles E.: *See—*
Clack, Willis E.; Kay, Clifford; and Nygren, Charles E., 3,815,747.

Nyssen, Adrianus Marinus: *See—*
Carrell, Herbert Daniel; and Nyssen, Adrianus Marinus, 3,815,455.

Oaks, Grover Edward, Jr. Trailer hitch adapter. 3,815,936, Cl. 280-415.00a.

Obayashi, Tomokazu: *See—*
Nagasawa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; Obayashi, Tomokazu; and Mizota, Teruhiko, 3,816,174.

Obenshain, George R.: *See—*
Yakubek, Louis P.; and Obenshain, George R., 3,816,088.

Oberholtzer, Jene V. Sewer relief valve. 3,815,629, Cl. 137-527.800.

Oberwager, Jerome, to National Teaching Aids, Inc. Kit for making work of art having the appearance of a stained-glass window. 3,815,263, Cl. 35-26.000.

O'Brien, James E.: *See—*
Wurst, John W.; and O'Brien, James E., 3,815,531.

O'Brien, Samuel James, to American Cyanamid Company. Process for bonding and flame proofing webs of synthetic fibers. 3,816,212, Cl. 156-331.000.

Occidental Petroleum Corporation: *See—*
Grannen, Edward; and Robinson, Leon, 3,816,356.

OCE-vander Grinten N.V.: *See—*
Janssen, Willem P. H. A.; and Paulissen, Martin G., 3,815,991.

Ochi, Osamu: *See—*
Takagi, Toru; Ochi, Osamu; and Mizushima, Yoshihiko, 3,816,108.

O'Connor, John L.: *See—*
O'Connor, John L.; and Newman, Joseph L. (said Newman assor. to said), 3,815,663.

O'Connor, John L.; and Newman, Joseph L., said Newman assor. to said O'Connor, John L. Die casting apparatus. 3,815,663, Cl. 164-321.000.

Odermann, Charles R.: *See—*
Weisz, William; and Odermann, Charles R., 3,815,532.

O'Driscoll, Kenneth F.; and Isen, Allan A., to Warner Lambert Company. Fabrication of soft plastic lens. 3,816,571, Cl. 264-1.000.

O'Farrell, Francis J., to International Telephone and Telegraph Corporation. Pseudonoise echo ranging system with improved range resolution without increase of transmitted code word repetition frequency. 3,816,829, Cl. 343-17.200.

Offshore Technology Corporation: *See—*
Biewer, Frank N., 3,815,846.

Ogar Manufacturing Corporation: *See—*
Di Rago, Michael, 3,816,010.

Ogawa, Masaya, to Minolta Camera Kabushiki Kaisha. Projection type duplicator. 3,815,992, Cl. 355-69.000.

Ogles, Ethridge F., to Selgo Pumps, Inc. Pump. 3,816,020, Cl. 415-111.000.

Ohba, Hiroshi: *See—*
Morita, Yoshiharu; Kikumoto, Ryoji; Ohba, Hiroshi; Nakamura, Akio; Fukuda, Kaoru; and Nomura, Tatsuo, 3,816,465.

Ohlschlager, Hans: *See—*
Kampfer, Helmut; Gotze, Johannes; Von Konig, Anita; and Ohlschlager, Hans, 3,816,131.
Riester, Oskar; and Ohlschlager, Hans, 3,816,141.

Ohlschlager, Hans; Riester, Oskar; and Dorlars, Alfons, to Agfa-Gevaert Aktiengesellschaft. Spectrally sensitized direct position silver halide emulsion layers. 3,816,138, Cl. 96-101.000.

Ohnuki, Katuhiro; Sato, Kazuhiro; Miyajima, Shin; and Hideo, Suyama, to Victor Company of Japan, Ltd. Curved piezoelectric elements. 3,816,774, Cl. 310-8.600.

Ohtsu, Yasuo; Nakatani, Seiji; and Fukura, Hiroshi, to Sumitomo Electric Industries, Ltd. Throw away insert. 3,815,192, Cl. 29-95.004.

Ohwaki, Haruki: *See—*
Nishiyama, Akira; Yoshino, Hirokazu; Yamaguchi, Tetsuo; Tsuboka, Eiichi; and Ohwaki, Haruki, 3,816,660.

Oil Base Germany GmbH & Co. KG: *See—*
Barthel, Horst, 3,816,148.

Oishi, Kazuo: *See—*
Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, 3,816,717.

Okada, Tomonori: *See—*
Kaneko, Haruo; Katagiri, Yoshio; and Okada, Tomonori, 3,816,825.

O'Keefe, Carling, Limited: *See—*
Bunnell, Arthur K., 3,815,808.

Oku, Tsuneo: *See—*
Suzuki, Yasuo; and Oku, Tsuneo, 3,816,290.

Okuzumi, Yozi, to Goodyear Tire & Rubber Company, The. Solid state polymerization process. 3,816,377, Cl. 260-75.00m.

Oldenburg, Howard H.: *See—*
Rambusch, Viggo Beach; Oldenburg, Howard H.; and White, Peter, 3,816,740.

Olin Corporation: *See—*
Crane, Jacob; Friedman, Sam; and Pryor, Michael J., 3,816,109.
Irish, Charles G., Jr.; Silva, Joseph W.; and Cowles, Raymond I., 3,815,507.
Schnabel, Wilhelm J., 3,816,496.

Olin Mathieson Chemical Corporation: *See—*
Kraus, Theodore C., 3,816,606.

Olivares, Ismael A.: *See—*
Gabrielsen, Rolf S.; and Olivares, Ismael A., 3,816,137.

Oliver, Robert F.: *See—*
Guard, Edward J.; and Oliver, Robert F., 3,815,182.

Olivetti, Ing. C., & C., S.p.A.: *See—*
Hsieh, Paul Y., 3,815,972.

Olsen, Robert C., to Illinois Tool Works Inc. Bottle carrier. 3,815,947, Cl. 294-87.200.

Olsen, Robert W., to Construction Specialties, Inc. Fastening system. 3,815,309, Cl. 52-489.000.

Olson, Emil, Inc.: *See—*
Olson, Roger E., 3,815,824.

Olson, John L. Cam lock vise. 3,815,894, Cl. 269-167.000.

Olson, Roger E., to Olson, Emil, Inc. Sand spreader. 3,815,824, Cl. 239-674.000.

Olson, Victor F. Utility cart. 3,815,933, Cl. 280-47.350.

Olsson, Frank C., to AMF Incorporated. Container contents retaining device. 3,815,774, Cl. 220-24.0gc.

Olympia Werke AG: *See—*
Strobel, Roland; and Frerichs, Peter, 3,815,430.

Olympus Optical Company Limited: *See—*
Gladstone, Robert, 3,815,427.

O'Malley, Conor C.; and Heintz, Ralph M., Sr. Apparatus for intraocular surgery. 3,815,604, Cl. 128-305.000.

Omron Tateisi Electronics Co.: *See—*
Yamamoto, Mititaka; and Hayakawa, Fumio, 3,816,730.

O'Neill, William J. Paint spray system. 3,816,025, Cl. 417-9.000.

Oniki, Yasuhiko: *See—*
Sekine, Kazuo; Mimura, Michio; and Oniki, Yasuhiko, 3,815,884.

Ono Pharmaceutical Co., Ltd.: *See—*
Hayashi, Masaki; and Ishihara, Atsunobu, 3,816,393.

Opaque Systems, Ltd.: *See—*
Cinque, Alphonse P., 3,816,646.

Opmeer, Arthur. Split level bird cage. 3,815,549, Cl. 119-17.000.

Oppenheimer, Michael H.: *See—*
Anselmo, Robert A.; Oppenheimer, Michael H.; and Genesi, Robert C., 3,816,766.

Orbit Manufacturing Company: *See—*
Shriver, Charles S., 3,815,670.

Orcon Corporation: *See—*
Bascom, Hollis H.; Greci, John J.; and Hoopengardner, Merle R., 3,816,203.

Oriental Photo Industrial Co., Ltd.: *See—*
Takegawa, Yukio; Matui, Takao; and Higuchi, Tetuya, 3,816,132.

Oringolts, Leonid Vladimirovich: *See—*
Bondarev, Vitaly Petrovich; Tusunian, Georgy Varlamovich; Budenny, Genady Georgievich; Mgeladze, Nodar Vladimirovich;

Anisimov, Andr Vladimirovich; Saradzhev, Georgy Mikhailovich; ShakhbudagianhShou, Suren Emmanuilovich; and Oringolts, Leonid Vladimirovich 3,815,745.
Orlowski, Jan Alexander: *See—*
Lee, Henry L., Jr.; Orlowski, Jan Alexander; and Kobashigawa, Alvin I., 3,815,239.
Ortho Pharmaceutical Corporation: *See—*
Hirsch, Allen Frederick, 3,816,406.
Karmas, George, 3,816,507.
Orthokinetics, Inc.: *See—*
Kazik, Raymond A., 3,815,586.
Osborn, Clairborn Lee; Sandner, Michael Ray; and Trecker, David John, to Union Carbide Corporation. Photonitrosation process using swirl-flow plasma arg radiation. 3,816,285, Cl. 204-162.0xn.
Oscar Mayer & Co., Inc.: *See—*
Vedvik, Andrew H., 3,815,319.
Osias, Alexandre: *See—*
Bui Hai, Nhu; and Osias, Alexandre, 3,816,835.
Ossendorf, Erich: *See—*
Meier, Fran; Ossendorf, Erich; and Wolfgarten, Hubert, 3,815,339.
Oster, Claude. Apparatus for and method of collecting and preserving cytologic samples. 3,815,580, Cl. 128-2.00w.
Osterreichische Stickstoffwerke Aktiengesellschaft: *See—*
Schmidt, Alfred, 3,816,591.
Ostwald, Richard, to Smith, Gordon, & Co., Inc. Air compressor housings. 3,815,965, Cl. 312-100.000.
Oswald, Alexis A.: *See—*
Griesbaum, Karl; Oswald, Alexis A.; and Hall, Daniel Noyes, 3,816,623.
Otsuka, Hiroaki; Manabe, Norihisa; and Konishi, Tatsuo, to Nippon Hoso Kyokai and Nippon Electric Company Limited. Magnetic recording method and apparatus using a multi-layer recording technique. 3,816,850, Cl. 360-55.000.
Ott, Owen J.; and Ginn, David W., to Data Interface, Inc., mesne. Electrostatic charge elimination for magnetic printing system. 3,816,799, Cl. 317-2.00r.
Ottensener Eisenwerk GmbH: *See—*
Sass, Jochen, 3,815,395.
Otterlei, Jon L. Timer switch apparatus. 3,816,757, Cl. 307-141.000.
Overbeck, Jurgen; and Naguib, Monir, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften ev. Methane oxidizing bacterial strain M 102, a method for obtaining it and a method for synthesizing protein with it. 3,816,250, Cl. 195-28.00r.
Owen, Alexander: *See—*
Hamlyn, Maxwell Charles; Kidney, Allan James; and Owen, Alexander, 3,816,632.
Owend-Illinois, Inc.: *See—*
Levene, Leon, 3,816,328.
Owens, Alfred E. Burial system with reuseable outer casket. 3,815,185, Cl. 27-3.000.
Owens-Corning Fiberglas Corporation: *See—*
Lin, Kingso C., 3,816,235.
Owens-Illinois, Inc.: *See—*
Bayer, John W., 3,816,364.
Daiga, Valdis R., 3,816,097.
Taylor, Lynn J., 3,816,162.
Yakubek, Louis P.; and Obenshain, George R., 3,816,088.
Yoldas, Bulent E., 3,816,163.
Paananen, Reuben R., to Automotive drip pad assembly. . 3,815,702, Cl. 180-69.100.
Pace, Anthony: *See—*
Skeen, Gary Robert, 3,815,644.
Pace, Virginia: *See—*
Skeen, Gary Robert, 3,815,644.
Pachmayr, Frank A., to Pachmayr Gun Works, Inc. Resilient pistol grip. 3,815,270, Cl. 42-71.00p.
Pachmayr Gun Works, Inc.: *See—*
Pachmayr, Frank A., 3,815,270.
Package Machinery Company: *See—*
Niemi, William B., 3,816,050.
Schoppee, Lawrence W.; and Meagher, James L., Jr., 3,816,052.
Padberg, Peter: *See—*
Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, 3,816,698.
Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, 3,816,699.
Pall Corporation: *See—*
Cooper, Roydon B., 3,815,542.
Rosenberg, David J., 3,815,754.
Pallos, Ferenc M.: *See—*
Mihailovski, Alexander; and Pallos, Ferenc M., 3,816,091.
Mihailovski, Alexander; and Pallos, Ferenc M., 3,816,541.
Pallos, Ferenc M.; and Menn, Julius J., to Stauffer Chemical Company. Insecticidal active geranyl and citronyl amine derivatives and their epoxides. 3,816,502, Cl. 6-11-74.
Palmer, Oskar. Method for production of concrete reinforcement lattice mats. 3,815,218, Cl. 29-471.300.
Pande-Rolfsen, Henrik, to Thune-Euraka A/S. System for unloading oil. 3,815,329, Cl. 55-163.000.
Panning, Martin H., to Blower Application Company. Combined shredding, compacting and incinerating apparatus. 3,815,521, Cl. 110-8.00r.
Paoletti, Charles: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,815,793.
Pappas, James J.; and Rossi, Albert, to Esso Research and Engineering Company. Block copolymers of unsaturated ester and a nitrogen containing monomer as V.I. improving and dispersant additives for oils. 3,816,314, Cl. 252-51.50a.
Papworth, Robert L.: *See—*
Sweet, Harold J.; Papworth, Robert L.; and Grimm, John G., Jr., 3,815,738.
Paragamian, Vasken, to McNeil Laboratories, Inc. Process for preparing 2-oxospiro[indoline-3,4'-thiochromans]. 3,816,449, Cl. 260-325.000.
Paragamian, Vasken, to McNeil Laboratories, Inc. Certain benzo thiepino-indoles and indoline-thiochromans. 3,816,455, Cl. 260-326.280.
Paret, Giancarlo, to Snam Progetti, S.p.A. Process for the recovery of aromatic hydrocarbons from mixtures containing the same. 3,816,302, Cl. 208-323.000.
Parker, Earl R.: *See—*
Pickus, Milton R.; Parker, Earl R.; and Zackay, Victor F., 3,815,224.
Parker, Frank S.: *See—*
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Pasquier, Yves. Construction of traveling building. 3,815,297, Cl. 52-64.000.
Patco Products, Inc.: *See—*
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Pattarini, Giovanni, to Fabbrica Automobili Isotta Fraschini e Motori Breda S.p.A. Fluid coupling gear and speed veriator unit. 3,815,444, Cl. 74-732.000.
Patterson, Eugene A., to Patco Products, Inc. Accessory cartridge for improving internal combustion engine efficiency. 3,816,083, Cl. 48-59.000.
Patterson, Philip M.: *See—*
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Patterson, Ronald A.: *See—*
Patterson, Ronald A.; and Majure, Walter N. (said Majure assor. to said), 3,815,262.
Patterson, Ronald A.; and Majure, Walter N., said Majure assor. to said Patterson, Ronald A. In-flight retractible landing gear training simulator for fixed landing gear aircraft. 3,815,262, Cl. 35-12.000.
Paulik, Frank E.: *See—*
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Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., 3,816,489.
Paulissen, Martin G.: *See—*
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Pauliukonis, Richard S. Power cylinder with piston return by own vacuum force. 3,815,481, Cl. 92-86.000.
Pavese, Franco, to Ferrero, P., & C. S.p.A. Apparatus for loading objects into selling display units. 3,815,324, Cl. 53-237.000.
Pavlo, William A.; and Conroy, Richard M., to General Battery Corporation. Process for casting molten metal. 3,815,659, Cl. 164-65.000.
Pavlovic, Jack D., to Pollution Recovery Systems. Oil/water separation and recovery system. 3,815,751, Cl. 210-242.000.
Paxton, Roy S., to Singer Company, The. Desoldering fixture. 3,815,806, Cl. 228-19.000.
Payer-Lux Eduard Payer: *See—*
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Pearl, David R., to Gerber Garment Technology, Inc. Method for holding sheet material by a vacuum holddown. 3,815,221, Cl. 29-559.000.
Pechhold, Engelbert, to Du Pont de Nemours, E. I., and Company. Electrical cable and process. 3,816,643, Cl. 174-107.000.
Peckham, Vernon D., to Kaman Sciences Corporation. System and method for measuring distance. 3,815,994, Cl. 356-4.000.
Peek, Hermanus Leonardus: *See—*
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Peereboom, Hans, to N.V. Industrieele Handelscombinatie Holland. Drilling platform with corresponding supply vessel. 3,815,540, Cl. 114-235.00r.
Pelster, Gerd; Wurtz, Volkmar; and Feess, Erich, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for printing and pad dyeing polyamide fabrous materials. 3,816,067, Cl. 8-54.000.
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Peltz, Gunter, to ITT Industries Inc. Electronic musical instrument with plural RC circuits for decay. 3,816,636, Cl. 84-1.100.
Penn Novelty Company, The, mesne: *See—*
Haigh, Thomas I., 3,816,211.
Pennebaker, Eugene S., Jr., to Esso Production Research Company. Method for operating in wells. 3,815,677, Cl. 166-253.000.
Penner, John. Release device for sockets incorporated in ratchet wrenches. 3,815,451, Cl. 81-184.000.
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Penn's Woods Products, Inc.: *See—*
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Pepe, Anthony Enrico; Legnick, Guenther Fritz; and Neuroth, Charles George, to Stauffer Chemical Company, mesne. Substrate coated with a room temperature curable organopolysiloxane and method for coating. 3,816,164, Cl. 117-72.000.

Peppler, William S., to Diamond International Corporation. Molding apparatus for producing deckle-free edges and windows in molded fiber products. 3,816,049, Cl. 425-324.000.

Pereboom, Willem Jan: *See—*
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Perkin-Elmer Corporation, The: *See—*
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Perkins, John L. Fish hook to fish pole retainer. 3,815,273, Cl. 43-25.200.

Perrin, Ronald, to St. Regis Paper Company. Gummed tape dispenser carton. 3,815,801, Cl. 225-47.000.

Pesaro, Mario: *See—*
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Dubs, Paul; and Pesaro, Mario, 3,816,445.
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Peters, Beldon A., to Esso Production Research Company. Wireline operated subsurface safety valve. 3,815,675, Cl. 166-72.000.

Petranyi, John F., to DEC International, Inc. Apparatus for dispensing liquid from a liquid supply manifold. 3,815,792, Cl. 222-373.000.

Petro-Tex Chemical Corporation: *See—*
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Pettay, Carol J. Hitch positioner. 3,815,939, Cl. 280-474.000.

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Pfefer, Irving. Film washing apparatus. 3,816,844, Cl. 354-328.000.

Pfizer Inc.: *See—*
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PHD, Inc.: *See—*
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Philco-Ford Corporation: *See—*
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Phillips Petroleum Company: *See—*
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Phillips, Ronald Frank, to Arizona Chemical Company, mesne. Process for copolymizing α-pinene and β-pinene utilizing a SiC14-AlC13 cocatalyst system. 3,816,381, Cl. 260-88.20d.

Phoenix Closures, Inc.: *See—*
Pollock, William J.; and Tagalakis, Peter, 3,815,314.

Pickus, Milton R.; Parker, Earl R.; and Zackay, Victor F., to United States of America, Atomic Energy Commission. Superconductive material. 3,815,224, Cl. 29-599.000.

Piech, Ferdinand; and Mezger, Hans, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Cooling installation for internal combustion engines, especially for the cylinder and cylinder head of internal combustion engines for aircraft. 3,815,557, Cl. 123-41.020.

Piemont, Emile Georges. Wood working machine. 3,815,647, Cl. 144-1.00c.

Piepenbrink, Maurice V., to Caswell-Runyan Company, Inc. Table actuated cutter guard. 3,815,441, Cl. 74-615.000.

Piet, Meyer, to Futurecraft Corporation. Pneumatic abrasive cutting apparatus. 3,815,286, Cl. 51-12.000.

Pioneer Packaging, Inc.: *See—*
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Piper, Frank R., to Penn's Woods Products, Inc. Diaphragm-type game caller. 3,815,283, Cl. 46-178.000.

Pirelli General Cable Works Limited: *See—*
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Plank, Charles J.; and Rosinski, Edward J., to Mobile Oil Corporation. Process for preparing a crystalline aluminosilicate zeolite. 3,816,342, Cl. 252-455.00z.

Plante, Emile A. P. Lobster plant. 3,815,546, Cl. 119-2.000.

Plastics Manufacturing Company: *See—*
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Pliev, Leonid Filippovich: *See—*
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Plumat, Emile; and Tossaint, Francois, to Glaverbel S.A. Method for preparing vitreous body by diffusion of ions through a coating layer. 3,816,222, Cl. 161-1.000.

Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
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Podlas, Thomas J., to Hercules Incorporated. Self-destructing gels. 3,816,151, Cl. 106-194.000.

Pohl, Heinz: *See—*
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Poirot, Eugene M. Fishing net. 3,815,279, Cl. 43-105.000.

Polaroid Corporation: *See—*
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Borror, Alan L.; and Garcia, Paulina P., 3,816,123.
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Karger, Eva R.; and MacGregor, Paul T., 3,816,453.
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Poll, Benjamin. Mulch pot planter. 3,815,524, Cl. 111-2.000.

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Pollock, Mayer, Steel Corporation: *See—*
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Pollock, William J.; and Tagalakis, Peter, to Phoenix Closures, Inc. Packaging method. 3,815,314, Cl. 53-15.000.

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Porosan Interests, U.S.A., Inc.: *See—*
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Porsche, Dr.-Ing., H.c.F., K.G.: *See—*
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Porsche, Dr.-Ing. H.c.F., K.G., Firma: *See—*
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Porter, Charles L., to General Motors Corporation. Vehicle body hood hinge. 3,815,176, Cl. 16-128.100.

Portis, Ralph G., to Midland Manufacturing Corporation. Control system for rod type tank gage. 3,815,416, Cl. 73-306.000.

Portland Chain Manufacturing Co. Division of Webster Mfg., Inc.: *See —*
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PPG Industries, Inc.: *See—*
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Primm, Raymond; McKeown, William L.; and Copeland, James S., to Innocation Industries Incorporated. Optically-coupled sensing and control system. 3,816,745, Cl. 150-221.000.
Prince, ARthur E., Jr., to Celanese Corporation. Drying and drawing process for polybenzimidazole continuous filamentary materials. 3,816,581, Cl. 264-233.000.
Prinz, Roy J., to Celanese Corporation. Purification of alkylene glycols. 3,816,549, Cl. 260-637.00r.
Probst, Richard O., to Ransburg Electro-Coating Corporation. Hydrostatic atomizing apparatus. 3,815,820, Cl. 239-15.000.
Process and system for the production and purification of helium: *See—*
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Process of preparing stable aqueous ethylene vinyl ester copolymer emulsions: *See—*
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Zeffren, Eugene; and Knohl, Richard B., 3,816,615.
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Rabin, Brian Robert; and Williams, David John. Biological test. 3,816,263, Cl. 195-103.50r.
Rabo, Jule A.; Poutsma, Marvin L.; and Skeels, Gary W., Jr., to Union Carbide Corporation. Crystalline metal aluminosilicates having and certain other salts irreversibly occluded therein. 3,816,341, Cl. 252-438.000.
Raden, daniel S., to Abbott Laboratories. Urethane catalyst. 3,816,339, Cl. 252-426.000.
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Raines, Clifford D. Plastic filled golf putter with double gooseneck shaft attachment member. 3,815,910, Cl. 273-80.00c.
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Ramachandran, Sundaresan; Fulton, James C.; and Bishop, Harry L., Jr., to Allegheny Ludlum Industries, Inc. Method for producing alloy steel. 3,816,100, Cl. 75-12.000.
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Rambusch Decorating Company: *See—*
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Rambusch, Viggo Beach; Oldenburg, Howard H.; and White, Peter, to Rambusch Decorating Company. Underwater lighting system. 3,816,740, Cl. 240-26.000.
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Ratmansky, Samuel C. Electrical discharge machining efficiency and safety monitoring system. 3,816,692, Cl. 219-69.00c.
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Raun, Arthur P., to Lilly, Eli and Company. Ruminant feed utilization improvement. 3,816,618, Cl. 424-115.000.
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Reavis, Gary E. Portable pipe rack. 3,815,613, Cl. 131-260.000.
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Redmore, Derek, to Petrolite Corporation. Dihydroacridine phosphonates. 3,816,428, Cl. 260-279.00r.
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Reed, Roy D. Combination transmitter and counter device for liquid flow meter. 3,816,714, Cl. 235-94.00r.
Reed, Samuel F., Jr. Telechelic copolymers of dienes and polymerizable ferrocene or carborane compounds. 3,816,380, Cl. 260-82.100.
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Regan, John William, to Combustion Engineering Inc. Reverberatory furnace using waste gas for combustion. 3,815,882, Cl. 266-19.000.
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Reid, Edward A., Jr.; and Cremean, Stephen P., to Davmor Industries, Inc. Radiant cooking apparatus. 3,815,489, Cl. 99-339.000.
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Reni, Cesare; Lugo, Luigi; and Gualdi, Giorgio, to Societa Italiana Resine S.p.A. Process for the manufacture of dichloroethane. 3,816,554, Cl. 260-659.00a.
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Rhine, Samuel: *See—*
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Rhodes, Alice E., 1/3 to Royer, George R. and 1/3 to Huffman, Gordon M. Dampening unit for an electric vaccum sweeper bag. 3,815,333, Cl. 55-233.000.
Rhodes, David George, to Batebilt Pty. Limited. Terminal block. 3,816,821, Cl. 339-198.00r.
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Richardson, Edwin Allen, to Shell Oil Company. Temporarily plugging and earth formation with a transiently gelling aqueous liquid. 3,815,681, Cl. 166-281.000.
Richardson-Merrell Inc.: *See—*
Grisar, J. Martin; Claxton, George P.; and Blohm, Thomas R., 3,816,457.
Richitelli, Charles G.: *See—*
Keener, Gary F.; Choiniere, Alcide; and Richitelli, Charles G., 3,815,596.
Richter, Albert P., Jr.; Bruner, James D.; Mazzagarri, Roy P.; and Hall, Hugh E., Jr., to Texaco Inc. Rotary drilling apparatus. 3,815,691, Cl. 175-56.000.
Richter, Sidney B.; and Stach, Leonard J., to Velsicol Chemical Corporation. Phosphoramidate ester insecticidal compositions. 3,816,620, Cl. 424-200.000.
Riddell, Vernon A. Involute grinding wheel dresser. 3,815,569, Cl. 125-11.00t.
Ridgeview Hosiery Mill Company: *See—*
Gaither, Albert C., 3,815,156.
Riely, Phyllis: *See—*
Spinosa, Dom; Riely, Phyllis; and Hodgson, Fred, 3,815,608.
Riester, Oskar: *See—*
Ohlschlager, Hans; Riester, Oskar; and Dorlars, Alfons, 3,816,138.
Riester, Oskar; and Ohlschlager, Hans, to Agfa-Gevaert Aktiengesellschaft. Fogged, direct positive silver halide emulsion sensitized with an isoindolinone polymethine dye. 3,816,141, Cl. 96-137.000.
Rieve, Robert W., to Atlantic Richfield Company. Vapor phase conversion of acetone to 3,5-xylenol in a single stage. 3,816,546, Cl. 260-621.00r.
Rightmire, Robert A.: *See—*
Selover, Theodore B.; Rightmire, Robert A.; and Regan, Philip R., 3,816,242.
Rigo, H. Gregor. Gaseous flow separator and heat exchange. 3,815,336, Cl. 55-269.000.
Riker Laboratories, Inc.: *See—*
McCann, Milton H., 3,815,881.
Rinaldi, Francesco; Alberti, Ferruccio; and Aguzzi, Paolo, to Montecatini Edison S.p.A. Process for the purification of rew sodium chloride brines. 3,816,592, Cl. 423-190.000.
Rinaldi, Joseph: *See—*
Wuthrich, Paul; Reder, Rodney W.; and Rinaldi, Joseph, 3,815,353.
Ringler, Tim N.; and Santilli, James N., to Westinghouse Electric Corporation. Protective system for series capacitors. 3,816,800, Cl. 317-12.00a.
Risler, Francis: *See—*
Courcier, Francois; Blouet, Jean; Courtel, Robert; and Risler, Francis, 3,816,309.
Ritter, Wayne G., Jr.: *See—*
Robertson, Elmer L.; Ritter, Wayne G., Jr.; and Kinslow, William G., Jr., 3,816,207.
Rivlin, Joseph, to Burlington Industries, Inc. Flame retardant for cellulosic fabrics. 3,816,068, Cl. 8-115.700.
Roberts, Frederick W.; and Drummond, Virgil D., to Rolock Incorporated. Closed loop gas cooling. 3,815,666, Cl. 165-1.000.
Roberts, Thomas, Jr. Construction unit assembly. 3,815,733, Cl. 206-322.000.
Robertshaw Controls Company: *See—*
Hendrick, Fred W., 3,815,873.
Robertson, Elmer L.; Ritter, Wayne G., Jr.; and Kinslow, William G., Jr., to Ethyl Development Corporation. Method and apparatus for hot stamping cylindrical articles. 3,816,207, Cl. 156-238.000.
Robins, Roland K.: *See—*
Shuman, Dennis A.; and Robins, Roland K., 3,816,400.
Robinson, Art I., to Bear Mfg. Corporation. Proportioning pump. 3,815,621, Cl. 137-99.000.
Robinson, Leon: *See—*
Grannen, Edward; and Robinson, Leon, 3,816,356.
Roblin Industries, Inc.: *See—*
Ruger, Verlyn C., 3,815,932.
Robot Foto und Electronic GmbH & Co. KG: *See—*
Maronde, Herbert; and Schmidt, Hans Dietrich, 3,816,841.
Rockland Systems Corporation: *See—*
Jackson, Leland B., 3,816,732.
Rockwell International Corporation: *See—*
Farrell, Thomas C.; and Fisher, Harry W., 3,815,627.
Soltez, David Michael, 3,816,677.
Rockwell Manufacturing Company: *See—*
Milleville, Bertram J.; Bake, Earl A.; and Lunt, William G., 3,815,870.
Rocla Concrete Pipes Limited: *See—*
Simpson, Charles William, 3,815,641.
Rodewald, Newell C.: *See—*
Burge, Harland L.; and Rodewald, Newell C., 3,815,356.
Roelofs, Henry M., to Nalco Chemical Company. Ceramic articles. 3,816,572, Cl. 164-28.000.
Rogers, Robert E.; and Davis, George F., Jr., to Copeland Corporation, mesne. Yoke-type compressor. 3,816,036, Cl. 417-536.000.
Rogers, W. Clark, Jr.; and Snitzer, Morton, to Lane Company, Inc., The. Rocker recliner chair. 3,815,954, Cl. 297-271.000.
Roh, Peter; and Strunk, Manfred, to Dynamit Nobel Aktiengesellschaft. Self-destructing apparatus for impact-detonating explosive devices. 3,815,505, Cl. 102-70.2ga.
Rohm & Haas Company: *See—*
Collinge, Alfred E.; Neubeck, Clifford E.; and Udinsky, John R., 3,816,259.
Lewis, Sheldon N.; and Yunaska, Matthew R., 3,816,168.
Wilson, Harold F.; and McRae, Dougal H., 3,816,092.
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Bayer, Horst O.; Hurt, William S.; and Aller, Harold E., 3,816,622.
Clemens, David H., 3,816,355.
Rohner, Dieter, to Akzona Incorporated. Measurement of speed of rotation by sonic and ultrasonic frequencies spectrum. 3,815,426, Cl. 73-488.000.
Rohr Corporation: *See—*
Grierson, David W., 3,816,675.
Rohr Industries, Inc.: *See—*
Brennan, John M., 3,815,357.
Medawar, George E., 3,815,215.
Noga, Robert A., 3,815,944.
Schubach, Theodor, 3,815,284.
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Tantlinger, Keith W., 3,815,307.
Wellnitz, Jerry N., 3,815,360.
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Rolland, Thomas P.: *See—*
Matt, Richard J.; and Rolland, Thomas P., 3,815,468.
Rolls-Royce (1971) Limited: *See—*
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Rolscreen Company: *See—*
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Rood, Alvin A.: *See—*
Horvath, Richard A.; Stumphauzer, William C.; Hogstrom, Edwin F.; and Rood, Alvin A., 3,816,165.
Rood, Alvin A.; Hogstrom, Edwin F.; and Stumphauzer, William C., to Nordson Corporation. Apparatus for striping inside seams of cans. 3,815,544, Cl. 118-2.000.
Roodvoets, Roger J.; and Stapert, James, Jr., to Laser Alignment, Inc. Target system for laying sewer pipes. 3,815,250, Cl. 33-286.000.
Rose, John Brewster: *See—*
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vencent, Peter Incledon, 3,816,563.
Rose, Shelby D. Blood withdrawing means. 3,815,579, Cl. 128-2.00f.
Roselli, Susan J. Slide calculator for determining selected periods of time. 3,815,269, Cl. 40-110.000.
Rosen, Herbert J.: *See—*
Fuller, Willard A.; Schulz, Arthur C.; and Rosen, Herbert J., 3,816,077.
Rosenbaum, Barry M.; Tegge, Bruce R.; Faure, Jacques; and Love, James H., to Esso Research and Engineering Company. Monomer and solvent recovery in polymerization processes. 3,816,379, Cl. 260-80.780.
Rosenberg, David J., to Pall Corporation. Box filter. 3,815,754, Cl. 210-445.000.
Rosenberg, Robert: *See—*
Cuomo, Jerome J.; Laibowitz, Robert B.; Mayadas, Ashok F.; and Rosenberg, Robert, 3,816,845.
Rosenquest, John B., Jr., to Dorr-Oliver Incorporated. Diaphragm pumps and actuating system therefor. 3,816,034, Cl. 417-395.000.

Rosenthal, Eric, to Schwartz, G., & Co. and Lubricating device. 3,815,709, Cl. 184-6.280.

Rosinski, Edward J.: *See—*
Plank, Charles J.; and Rosinski, Edward J., 3,816,342.

Ross, George F.; and Swink, Marvin N., to United States of America, Atomic Energy Commission. Fast acting valve. 3,815,619, Cl. 137-68.000.

Ross, Irving D., Jr., to Youngstown Steel Door Company. Screw actuated hopper gate. 3,815,515, Cl. 105-282.00r.

Rossel Uclaf: *See—*
Bardoneschi, Roland; and Muller, Georges, 3,816,396.

Rossi, Albert: *See—*
Pappas, James J.; and Rossi, Albert, 3,816,314.

Rossi, Enzo; and Fattori, Silvano, to Snam Progetti. Lubricating compositions inhibited from oxidation. 3,816,312, Cl. 252-48.200.

Roth, James F.: *See—*
Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., 3,816,488.
Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., 3,816,489.

Roth, Johann, to Braun Aktiengesellschaft. Means for automatically recording a title or heading in movie cameras. 3,815,980, Cl. 352-90.000.

Rowan, Robert A. Liquid fertilizer applicator. 3,815,830, Cl. 239-163.000.

Rowland, Ronald: *See—*
Haszeldine, Robert Neville; and Rowland, Ronald, 3,816,286.

Roy, Clarence H. Copper etchant effluent treatment. 3,816,306, Cl. 210-49.000.

Royer, George R.: *See—*
Rhodes, Alice E., 3,815,333.

Rubin, Isaac D.: *See—*
Morduchowitz, Abraham; and Rubin, Isaac D., 3,816,315.

Rudinger, Josef: *See—*
Gillessen, Dieter; Rudinger, Josef; and Studer, Rolf, 3,816,385.

Ruger, Verlyn C., to Roblin Industries, Inc. Front gate construction for shopping cart. 3,815,932, Cl. 280-33.99f.

Rundqvist, Lars-Goran, to AB Celleco. Method and apparatus for cleaning strainers. 3,816,176, Cl. 134-34.000.

Russ, Paul E., Sr.; McComber, Donald R.; and Patterson, Philip M., to Gates Rubber Company, The. Endless track and slide therefor. 3,815,960, Cl. 305-14.000.

Russell, Delbert A.: *See—*
Shaver, David M.; and Russell, Delbert A., 3,816,662.

Russell, Edward David, to Stanley Tools Limited. Cutting or abrading elements. 3,815,189, Cl. 29-78.000.

Russell, Edward David; and Shelton, George William Ronald, to Stanley Tools Limited. Cutting or abrading elements. 3,815,190, Cl. 29-78.000.

Russell, Jack A.; Walker, Jerome F.; and Hardenbrook, James M., to Brunswick Corporation. Split detecting system. 3,815,909, Cl. 273-54.00c.

Russell, Stanley L.; Gueldenpfenning, Klaus; and Pommerening, Uwe A., to Stromberg-Carlson Corporation. Operator loop complex. 3,816,665, Cl. 179-18.0ad.

Ryan, Donald P., to Edo-Aire; a division of Edo Corporation. Aircraft ADF with digital frequency display and timer. 3,816,833, Cl. 343-113.00r.

Ryan, John R.: *See—*
Searight, Charles E.; Ryan, John R.; and Brasfield, Steven H., 3,816,107.

Ryan, Kelly P., to Blair Manufacturing Co., Inc. Road grader blade support. 3,815,686, Cl. 172-783.000.

Ryazanov, Alexei Nikolaevich: *See—*
Kainson, Anatoly Yakovlevich; Razygraev, Jury Sergeevich; Sorokin, Nikolai Elizarovich; Dobrokhotov, Sergei Alexandrovich; Sokolov, Veniamin Prokofievich; Zaitsev, Nikolai Ivanovich; Zandman, Boris Genikhovich; Telyatnikov, Boris Peisakhovich; Kholin, Nikoai Dmitrievich; and Ryazanov, Alexei Nikolaevich, 3,815,525.

Rygiol, Henry V. Center unwinding spool. 3,815,845, Cl. 242-129.000.

Saez, Jean-Michel. Guard-rail and method of assembly thereof. 3,815,876, Cl. 256-22.000.

Sagnard, Francois: *See—*
Charron, Jean-Claude; and Sagnard, Francois, 3,815,813.

Sahm, William H., III: *See—*
Korn, Sebald R.; Fox, Richard W.; and Sahm, William H., III, 3,816,763.

Saito, Jiro: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Ito, Humio, 3,816,575.

Saito, Nagao; and Kuji, Yoichi, to Mitsubishi Electric Corporation. Apparatus for electrolytically etching a workpiece. 3,816,292, Cl. 204-225.000.

Sakauma, Yasuzi: *See—*
Nakamura, Toshio; Sakauma, Yasuzi; Egawa, Hitoshi; Kawai, Sadaharu; and Motegi, Shoji, 3,816,783.

Sakoe, Hiroaki; and Chiba, Seibi, to Nippon Electric Company, Limited. Computer for calculating the similarity between patterns and pattern recongition system comprising the similarity computer. 3,816,722, Cl. 235-152.000.

Sakurai, Shigenori: *See—*
Shimizu, Shozo; Iwase, Tetsumi; Hara, Hideki; Hori, Ryozo; and Sakurai, Shigenori, 3,816,344.

Salbeck, Gerhard: *See—*
Horlein, Gerhard; Salbeck, Gerhard; Emmel, Ludwig; and Werner, Bonin, 3,816,456.

Sama, Nicholas. Purifier device. 3,815,753, Cl. 210-284.000.

San Pietro, Carlo, to Mial S.p.A. Method of winding plastic film capacitors. 3,815,188, Cl. 29-25.420.

Sanborn, James E.; Lemmons, William R.; and Ramey, James M., to Celanese Corporation. Method for making a stabilized solution of concentrated aqueous formaldehyde. 3,816,539, Cl. 260-606.000.

Sandner, Michael Ray: *See—*
Osborn, Clairborn Lee; Sandner, Michael Ray; and Trecker, David John, 3,816,285.

Sandoz Ltd.: *See—*
Bitterli, Peter; and Kehrer, Fritz, 3,816,448.
Hofer, Kurt; and Moesch, Rudolf, 3,816,568.

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Houlihan, William J., 3,816,438.

Sandstrom, Unto: *See—*
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Sandvik Aktiebolag: *See—*
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Santilli, Arthur A.: *See—*
Kim, Dong H.; and Santilli, Arthur A., 3,816,423.

Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., to'American Home Products Corporation. N,N'-(naphthylenedioxydiethylene)bis(di (lower)-alkylamines) and the salts thereof. 3,816,430, Cl. 260-570.700.

Santilli, James N.: *See—*
Ringler, Tim N.; and Santilli, James N., 3,816,800.

Sapir, Said, to International Telephone and Telegraph Corporation. Solid state thermostat. 3,815,815, Cl. 237-78.000.

Saradzhev, Georgy Mikhailovich: *See—*
Bondarev, Vitaly Petrovich; Tusunian, Georgy Varlamovich; Budenny, Genady Georgievich; Mgeladze, Nodar Vladimirovich; Anisimov, Andr Vladimirovich; Saradzhev, Georgy Mikhailovich; Shakhbudagian-Shou, Suren Emmanuilovich; and Oringolts, Leonid Vladimirovich 3,815,745.

Sarot, Pierre; Delattre, Michel; and Decamps, Alain, to Solvay & Cie. Activation of peroxide washing and bleaching baths. 3,816,319, Cl. 252-95.000.

Sasaguri, Kiichiro: *See—*
Kobayashi, Hidehiko; and Sasaguri, Kiichiro, 3,816,368.

Sass, Jochen, to Ottensener Eisenwerk GmbH. Method and device for heating and flanging circular discs. 3,815,395, Cl. 72-69.000.

Sather, Delaine C., to Collins Radio Company. Bit serial divider with full scale capabilities. 3,816,733, Cl. 235-164.000.

Sathicq, Robert: *See—*
Morane, Bruno P.; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,815,793.

Sato, Akira: *See—*
Shiba, Keisuke; Amano, Hiroyuki; Ueda, Hirozo; and Sato, Akira, 3,816,121.

Sato, Hiroshi: *See—*
Yagi, Yoshiharu; Sato, Hiroshi; Narisawa, Shizuo; Yasui, Seimei; Kogayashi, Akiro; Hino, Minoru; and Hata, Kazuhiko, 3,816,567.

Sato, Humiyuki: *See—*
Sawagata, Shinichi; Tanaka, Tokushirou; and Sato, Humiyuki, 3,816,789.

Sato, Kazuhiro: *See—*
Ohnuki, Katuhiro; Sato, Kazuhiro; Miyajima, Shin; and Hideo, Suyama, 3,816,774.

Sato, Masamichi: *See—*
Fukushima, Osamu; Sato, Masamichi; and Matsumoto, Seiji, 3,816,114.

Sato, Masamichi; and Komaki, Takao, to Fuji Photo Film Co., Ltd. Electrophotograph developing apparatus. 3,815,545, Cl. 118-637.000.

Sato, Tadashi: *See—*
Chibata, Ichiro; Tosa, Tetsuya; Sato, Tadashi; and Mori, Takao, 3,816,254.

Saucy, Gabriel, to Hoffmann-La Roche Inc. 3-Substituted 6$\alpha\beta$-alkylcyclopenta [f] [1] benzopyrans and-naphtho [2,1-b] pyrans. 3,816,458, Cl. 260-340.900.

Sauer, Gerhard: *See—*
Eder, Ulrich; and Sauer, Gerhard, 3,816,536.

Sauerman Bros., Inc.: *See—*
Hubbell, Clifton H., 3,816,012.

Saupe, Martin: *See—*
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Sawada, Yasuhiro: *See—*
Tsujihata, Keiji; Sawada, Yasuhiro; Ishikawa, Yasushi; Matsubara, Mitsuteru; and Iwata, Minoru, 3,816,096.

Sawagata, Shinichi; Tanaka, Tokushirou; and Sato, Humiyuki, to Tokyo Shibaura Electric Co., Ltd. In-line type triple electron gun assembly. 3,816,789, Cl. 313-243.000.

Sawyer, Richard G.: *See—*
Aldrich, Robert G.; Keller, Douglas V., Jr.; and Sawyer, Richard G., 3,815,826.

Saxl, Karel, to Imperial Metal Industries (Kynoch) Limited. Apparatus for reducing the thickness of metal. 3,815,400, Cl. 72-189.000.

Scarelli, David F. Condition responsive switch device. 3,815,816, Cl. 337-331.000.

Schaar, Charles H., to Colgate-Palmolive Company, mesne. Expandable article. 3,816,227, Cl. 161-49.000.

Schack, John B.: *See*—
Schille, Samuel C.; and Schack, John B., 3,815,304.

Schack, Warren R., to Swift & Company. Method for producing a commercially sterile shelf-stable containerized fried meat product. 3,816,633, Cl. 426-407.000.

Schaefer, Jean Edward, to Procter & Gamble Company, The. Catamenial aggregate absorbent body. 3,815,601, Cl. 128-285.000.

Schaefer, Maurice E.: *See*—
Brown, William L., Jr.; Hoffman, John L.; and Schaefer, Maurice E., 3,815,410.

Schaidl, Hubert: *See*—
Goiffon, Thierry; Lehmann, Hans Rudolf; and Schaidl, Hubert, 3,815,470.

Schaller, Karl: *See*—
Cayol, Andre; Chenal, Jean-Claude; Clottes, Georges; Schaller, Karl; Skok, Jean; and Venobre, Henri, 3,816,247.

Schamber, James N., 10% to Lee, Raymond, Organization, Inc., The. Scuba suit hanger. 3,815,797, Cl. 223-88.000.

Schantz, Ronald K., to Westinghouse Air Brake Company. Fluid control system. 3,815,472, Cl. 91-189.000.

Schatz, Hermann: *See*—
Brunnmueller, Friedrich; Schatz, Hermann; Mayer, Johann; and Grabowsky, Otto, 3,816,376.

Schatzman, Edward W., to Avey Machine Tool Co. Division of Motch & Merryweather Machinery Company, The. Power drilling machine with resistance triggered retraction. 3,816,016, Cl. 408-11.000.

Schawartz, Jozsef; Szuts, Tamas; and Szentmiklosi, Peter, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Thiadiazolyl amino penicillins. 3,816,411, Cl. 260-239.100.

Scheibitz, Maria: *See*—
Weyde, Edith; Scheibitz, Maria; and Meyer, Rudolf, 3,816,133.

Scheidt, Thomas R. Pulse monitoring system. 3,815,583, Cl. 128-2.05p.

Schelich, Ardell J.: *See*—
Hoffman, John E.; and Schelich, Ardell J., 3,815,752.

Schellenberg, Dietmar; and Bent, Richard L., to Eastman Kodak Company. Photographic color developing solutions containing p-toluenesulfonic acid salts of p-phenylenediamine. 3,816,134, Cl. 96-55.000.

Schenk, Peter, to Dzus Fastener Co., Inc. Latch fastener. 3,816,009, Cl. 403-108.000.

Scherer, Carl A.; and Muirhead, Hugh J., to General Motors Corporation. Unified orifice filter/muffler expansion controller. 3,815,379, Cl. 62-296.000.

Schering AG: *See*—
Burba, Christian; and Griebsch, Eugen, 3,816,511.
Eder, Ulrich; and Sauer, Gerhard, 3,816,536.

Schering Corporation: *See*—
Shapiro, Elliot L.; and Ganguly, Ashit K., 3,816,472.

Schibler, Luzius, to Ciba-Geigy AG. Process for obtaining wool fat by washing raw wool with reactive surface-active agents. 3,816,487, Cl. 269-412.800.

Schild, Josef: *See*—
Morell, Josef; Nowak, Johann; Schild, Josef; and Wessner, Harald, 3,815,847.

Schille, Samuel C.; and Schack, John B., to Concrete Conduit Company, Inc. Utility trench and trench system. 3,815,304, Cl. 52-100.000.

Schindler, Herward: *See*—
Schmidt, Wilhelm; and Schindler, Herward, 3,816,612.

Schinner, Thomas J.: *See*—
Kleinmeyer, Vernon T.; and Schinner, Thomas J., 3,816,707.

Schlegel, Richard: *See*—
Biller, Efim; Goller, Roman; Schlegel, Richard; and Pflugk, Hellmuth, 3,816,547.

Schleif, George H. Fish hook apparatus with covering body portion. 3,815,274, Cl. 43-42.100.

Schlesinger, Sheldon I., to American Can Company. Photopolymerization of mixtures of epoxide materials and tetrahydrofuran. 3,816,279, Cl. 204-159.110.

Schmadel, Edmund, to Henkel & Cie GmbH. Polyester salts containing quaternary ammonium groups. 3,816,378, Cl. 260-75.00n.

Schmid, Rolf; Lohse, Friedrich; Fisch, Willy; and Batzer, Hans, to Ciba-Geigy AG. Adducts, containing epoxide groups, from polyglycidyl compounds and acid polyesters of aliphatic-cycloaliphatic dicarboxylic acids, process for their manufacture and use. 3,86,365, Cl. 260-22.00d.

Schmidt, Alfred, to Osterreichische Stickstoffwerke Aktiengesellschaft. Process for the recovery of aluminium and fluorine from a dilute aqueous solution. 3,816,591, Cl. 423-114.000.

Schmidt, Ernst Machiel; and Post, Hendrik Alle, to U.S. Philips Corporation. Device and holder therefor for inserting a hollow coupling member into bone marrow. 3,815,605, Cl. 128-305.000.

Schmidt, Hans Dietrich: *See*—
Maronde, Herbert; and Schmidt, Hans Dietrich, 3,816,841.

Schmidt, Richard J.: *See*—
Nichol, Thomas W.; and Schmidt, Richard J., 3,815,388.

Schmidt, Uwe J.: *See*—
Thust, Walter; and Schmidt, Uwe J., 3,816,824.

Schmidt, Wilhelm; and Schindler, Herward, to Deutsche Gold- Und Silber Scheideanstalt vormals Roessler. Process for the production of basically reacting pharmaceuticals. 3,816,612, Cl. 424-45.000.

Schmidt, Willi Johann, to Kalle Aktiengesellschaft. Asymmetrical transverse stretching of plastic film. 3,816,584, Cl. 264-289.000.

Schmied, Rudolf: *See*—
Loliger, Willi; and Schmied, Rudolf, 3,816,427.

Schmitz, James E.; and Suby, Duard J. Stump pulling implement. 3,815,266, Cl. 37-2.00r.

Schnabel, Wilhelm J., to Olin Corporation. Solvent extraction and distillation technique for purification of organic isocyanates. 3,816,496, Cl. 260-453.0sp.

Schnabele, Werner: *See*—
Schubert, Johannes; and Schnabele, Werner, 3,815,469.

Schneider, Felix; and Kampmann, Gerhard, to Waggon Union GmbH. Side wall particularly for railroad freight cars. 3,815,518, Cl. 105-378.000.

Schneider, Hans, to Sulzer Brothers Ltd. Process for making a metallurgically slow reacting mold. 3,815,658, Cl. 164-35.000.

Schneider, Hans, to Sulzer Brothers Ltd. Chromium-base alloy for making a chill-mold and a process of making same. 3,816,111, Cl. 75-176.000.

Schneider, Jean-Claude, to Fabrique d'Horlogerie CHS. Tissot & Fils S.A. Regulator assembly for the fine adjustment of timepiece movements. 3,815,355, Cl. 58-109.000.

Schnell, Dietrich H.: *See*—
Beaton, Arthur L.; Schnell, Dietrich H.; and Beaton, Victor A., 3,815,278.

Schnyder, Conrad Wolfgang; and Schnyder-Seibert, Erika. Arrangement for automatically cleaning a closet seating surface on a closet seat ring after use. 3,815,158, Cl. 4-100.000.

Schnyder-Seibert, Erika: *See*—
Schnyder, Conrad Wolfgang; and Schnyder-Seibert, Erika, 3,815,158.

Schoppee, Lawrence W.; and Meagher, James L., Jr., to Package Machinery Company. Operating apparatus for the platens in a thermoforming machine. 3,816,052, Cl. 425-406.000.

Schouteeten, Robert Andre Gustave; and Biais, Andre Julien Augoste Fernand, to Graco, Inc. Pumps and painting installations. 3,816,028, Cl. 417-214.000.

Schreiber, George J., to Killark Electric Manufacturing Company. Protective lens for photocell. 3,815,968, Cl. 350-1.000.

Schreiner, Heinz R.; Hamilton, Robert W.; and Francis, Arthur W., to Union Carbide Corporation. Diving gas mixtures and method of deep diving. 3,815,591, Cl. 128-142.000.

Schreyer, Gerd: *See*—
Kleemann, Axel; Schreyer, Gerd; and Weiberg, Otto, 3,816,479.

Schreyer, Gerd; Schwarze, Werner; Weigert, Wolfgang; and Horst, Weigel, to Deutsche Gold- und Silber-Scheideanstalt vormal Roessler. Process for oxidation of vicinal diol groups into carboxyl groups with oxygen. 3,816,525, Cl. 260-531.00r.

Schroder, Johann: *See*—
Huizing, Albert; and Schroder, Johann, 3,816,600.

Schubach, Theodor, to Rohr Industries, Inc. Releasable hinge mount for window. 3,815,284, Cl. 49-466.000.

Schubert, Johannes; and Schnabele, Werner, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Method and device for launching missiles particularly antitank projectiles. 3,815,469, Cl. 89-1.701.

Schudel, Peter: *See*—
Hug-Indebitzin, Marianne; Pesaro, Mario; and Schudel, Peter, 3,816,535.

Schuette, William H., to United States of America, Health, Education and Welfare. Modulated sine wave flowmeter. 3,815,582, Cl. 128-2.05f.

Schuhmann, Peter, to SKF Industrial Trading and Development B.V. and Apparatus for mounting bearing assemblies. . 3,816,013, Cl. 403-368.000.

Schuhrer, Klemens: *See*—
Erdmann, Dietrich; Schuhrer, Klemens; Koch, Wolfgang; and Gerhart, Schneider, 3,816,464.

Schulenberg, Heinrich; and Seien, Gunter, to Gea Luftkuhlergesellschaft Happel GmbH & Co., KG. Apparatus for applying fins to stationarily held pipes by means of entrainment members. 3,815,203, Cl. 29-202.00r.

Schultz, William J.; and Sherman, Patsy O., to Minnesota Mining and Manufacturing Company. Stain-releasing textiles of synthetic fibers and process for treating textiles of synthetic fibers. 3,816,167, Cl. 117-138.80r.

Schulz, Arthur C.: *See*—
Fuller, Willard A.; Schulz, Arthur C.; and Rosen, Herbert J., 3,816,077.

Schulze, Erwin F., to Addressograph-Multigraph Corporation. High speed document feed. 3,815,900, Cl. 271-118.000.

Schumann, Robert W., to Nicolet Instrument Corporation. Digital oscilloscope and method of storing and displaying waveforms. 3,816,815, Cl. 324-112.000.

Schurter, Gary Lee: *See*—
Holliday, Harvey Ray; and Schurter, Gary Lee, 3,816,564.

Schutt, Hartwig: *See*—
Werdehausen, Achim; Weiss, Herbert; and Schutt, Hartwig, 3,816,483.

Schutte, Robert, 10% to Gulf Oil Canada Limited, 30% each to Canada-Cities Service, Ltd., Imperial Oil, Limited and Atlantic Richfield Canada Ltd. Clarification of tar sands middlings water. 3,816,305, Cl. 210-42.000.

Schwaab, W. L., Lackfabriken KG: *See*—
Becker, Georg; and Kleindrettle, Karl, 3,815,535.

Schwartz, G., & Co.: *See*—
Rosenthal, Eric, 3,815,709.
Schwartz, Joseph M.: *See*—
Marcus, Douglas Larry, 3,815,573.
Schwartz, Martin L.: *See*—
Zinn, Harold; Schwartz, Martin L.; and Shavel, John, Jr., 3,816,628.
Schwartz, Nelson E.: *See*—
Beard, Franklin; and Schwartz, Nelson E., 3,815,301.
Schwarz, Josef, to Bizerba-Werke Wilhelm Kraut KG. Scale beam bearing. 3,815,695, Cl. 177-261.000.
Schwarze, Werner: *See*—
Schreyer, Gerd; Schwarze, Werner; Weigert, Wolfgang; and Horst, Weigel, 3,816,525.
Schweitzer, E. O., Manufacturing Co., Inc.: *See*—
Schweitzer, Edmund O., Jr., 3,816,816.
Schweitzer, Edmund O., Jr., to Schweitzer, E. O., Manufacturing Co., Inc. Indicating and automatically resettable system for detection of fault currefft flow in a conductor. 3,816,816, Cl. 324-133.000.
Schweitzer, Roland: *See*—
Weyer, Rudi; Aumuller, Walter; Schweitzer, Roland; Weber, Helmut; and Hubner, Manfred, 3,816,424.
Scotese, Anthony C.: *See*—
Santilli, Arthur A.; Scotese, Anthony C.; and Bell, Stanley C., 3,816,430.
Scott, Ray A.; Bossard, Fredrick R.; Strang, Elmer J.; and Mikovits, John L., to Coats Company, Inc., The. Tire changing apparatus. 3,815,653, Cl. 157-1.240.
Scovill Manufacturing Company: *See*—
Daddona, Domenic John, Jr., 3,815,183.
Scrogin, Willard D. Reel. 3,815,842, Cl. 242-96.000.
Searight, Charles E.; Ryan, John R.; and Brasfield, Steven H., to Cataphote Corporation. Method of increasing chemical durability of glass. 3,816,107, Cl. 65-30.000.
Searle, G. D., & Co.: *See*—
Krimmel, Carl Peter, 3,816,509.
Lenz, George R., 3,816,480.
Sedlak, Mirko S. Food plate service cover. 3,815,736, Cl. 206-501.000.
Seger, Paul Robert, to Jackson, George Wilburt. Quick action nut assembly for screw type jacks. 3,815,434, Cl. 74-424.80a.
Seien, Gunter: *See*—
Schulenberg, Heinrich; and Seien, Gunter, 3,815,203.
Seifert, Edwin A., Jr. Torsion bar clamp. 3,815,685, Cl. 172-711.000.
Seitz, Marianne. Suspension device for displaceably suspending drapes and curtains. 3,815,174, Cl. 16-94.00d.
Seitz, William R., to Bendix Corporation, The. Closed loop engine control system. 3,815,561, Cl. 123-119.00r.
Sekine, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Zip fasteners. 3,815,181, Cl. 24-205.10c.
Sekine, Kazuo; Mimura, Michio; and Oniki, Yasuhiko, to Nippon Kokan Kabushiki Kaisha. Cutting apparatus for large plates. 3,815,884, Cl. 266-23.00k.
Self-adjusting linear actuator: *See*—
Kobelt, Jack R., 3,815,471.
Selgo Pumps, Inc.: *See*—
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Sell, Abdul Harry, to Darf Corporation. Method for harvesting grapes. 3,815,343, Cl. 56-1.000.
Selover, Theodore B.; Rightmire, Robert A.; and Regan, Philip R., to Standard Oil Company, The. Process for producing boron nitride felt. 3,816,242, Cl. 162-157.00r.
Seltzer, Raymond, to M&T Chemicals Inc. Diaryl perthiocyanates. 3,816,441, Cl. 260-302.0sd.
Semenko, Nicholas E. Information display device for cigarette lighters. 3,816,057, Cl. 431-253.000.
Seminoff, Arnold: *See*—
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Semsel, Andrew Milo: *See*—
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Sendzimir, T., Inc.: *See*—
Sendzimir, Tadeusz; and Turley, John W., 3,815,401.
Sendzimir, Tadeusz; and Turley, John W., to Sendzimir, T., Inc. Housing construction for cluster type cold rolling mills. 3,815,401, Cl. 72-242.000.
Serban, Alexander; and Engel, Phillip Knox, to ICI Australis Limited. Synthesis of 2,3-dihydro-2,2-dimethyl-7-benzo furanyl N-methylcarbamate. 3,816,473, Cl. 260-346.200.
Serra, Norman R. Coacting wheel ball projecting device. 3,815,567, Cl. 124-1.000.
Sessoms, James M. Solenoid controlled paper handling mechanism. 3,815,722, Cl. 197-127.00r.
Seymour, Samuel L., to PPG Industries, Inc. Glass sheet press shaping apparatus. 3,816,089, Cl. 65-273.000.
Shakhbudagian-Shou, Suren Emmanuilovich: *See*—
Bondarev, Vitaly Petrovich; Tusunian, Georgy Varlamovich; Budenny, Genady Georgievich; Mgeladze, Nodar Vladimirovich; Anisimov, Andr Vladimirovich; Saradzhev, Georgy Mikhailovich; Shakhbudagian-Shou, Suren Emmanuilovich; and Oringolts, Leonid Vladimirovich 3,815,745.
Shank, Herbert C., Jr., to Anchor Hocking Corporation. Wrap around decoration applying apparatus. 3,816,221, Cl. 156-492.000.
Shapiro, Elliot L.; and Ganguly, Ashit K., to Schering Corporation. Azido analogs of griseofulvin. 3,816,472, Cl. 260-346.20g.
Sharman, Samuel H.; and Banzik, Mitchell, to Chevron Research Company. Method of washing fabrics using polysulfonated alkylphenols. 3,816,353, Cl. 252-558.000.
Shavel, John, Jr.: *See*—
Von Strandtmann, Max; Cohen, Marvin P.; Klutchko, Sylvester; and Shavel, John, Jr., 3,816,466.
Zinn, Harold; Schwartz, Martin L.; and Shavel, John, Jr., 3,816,628.
Shaver, David M.; and Russell, Delbert A., to GTE Automatic Electric Laboratories Incorporated. Combination telephone and video communication system. 3,816,662, Cl. 179-2.0tv.
Shaver, J. Lyle, to Allis-Chalmers Corporation. Blower wheel construction. 3,816,023, Cl. 416-178.000.
Shaw, Daniel J. C., to International Harvester Company. Hydraulic control valve. 3,815,631, Cl. 137-596.000.
Shaw, Gordon; and Cusack, Noel James, to University of Bradford, The. 1-Amine nucleosides. 3,816,399, Cl. 260-211.50r.
Shell Oil Company: *See*—
Breitigam, Walter V.; and Low, Hans, 3,816,519.
Richardson, Edwin Allen, 3,815,681.
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Shelton, George William Ronald: *See*—
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Shepherd, Brian, to Smiths Industries Limited. Divider circuits. 3,816,759, Cl. 307-225.000.
Sherman, Patsy O.: *See*—
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Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., 3,815,662.
Shiba, Keisuke; Amano, Hiroyuki; Ueda, Hirozo; and Sato, Akira, to Fuji Photo Film Co., Ltd. Direct positive photographic material containing a color coupler under one micron in size and fogged silver halide grains with substantially no internal sensitivit having absorbed on the surface a desensitizing dye containing a solubilizing group. 3,816,121, Cl. 96-97.000.
Shields, Robert G.: *See*—
Miller, Leon F.; Herbruggen, Henry J.; and Shields, Robert G., 3,815,662.
Shillinglaw, John P., Jr.: *See*—
Coleman, Richard L.; Cummins, Billy H.; and Shillinglaw, John P., Jr., 3,816,295.
Shimano Industrial Co., Ltd.: *See*—
Tarutani, Satoshi, 3,815,439.
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Yokosuka, Satosh, to Tokyo Shibaura Electric Co., Ltd. Photoconductive comprising cadmium selenide. 3,816,787, Cl. 313-94.000.
Shimizu, Shozo; Iwase, Tetsumi; Hara, Hideki; Hori, Ryozo; and Sakurai, Shigenori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Process for producing a catalyst. 3,816,344, Cl. 252-455.00r.
Shimizu, Yasuhiro: *See*—
Arakawa, Kazuo; Shinohara, Koichi; and Shimizu, Yasuhiro, 3,816,790.
Shimmin, Lawrence E., to Copley Press, Incorporated, The. Equipment using novel paper storage means. 3,815,457, Cl. 83-80.000.
Shimomura, Koichi: *See*—
Wakamatsu, Hachiro; and Shimomura, Koichi, 3,816,513.
Shimotori, Kazumi; Tokoro, Hirokazu; Nakamura, Shinichi; and Kawakita, Katsuhiko, to Tokyo Shibaura Electric Co., Ltd. Heat-resistant and corrosion-resistant high chromium-nickel alloy. 3,816,110, Cl. 75-171.000.
Shinohara, Koichi: *See*—
Arakawa, Kazuo; Shinohara, Koichi; and Shimizu, Yasuhiro, 3,816,790.
Shionogi & Co., Ltd.: *See*—
Nagata, Wataru; and Hayase, Yoshio, 3,816,570.
Shiozaki, Hisayoshi: *See*—
Konishi, Kenzo; Kitao, Teijiro; Matsuoka, Masaru; and Shiozaki, Hisayoshi, 3,816,431.
Showa Denko Labushiki Kaisha: *See*—
Tsuchihara, Toyoji; Yawaka, Youhei; and Noguchi, Takeshi, 3,816,362.
Showalter, Merle Robert; and Rhine, Samuel. Pressure compensated air throttle and air-fuel control system. 3,815,562, Cl. 123-119.00r.
Shriver, Charles S., to Orbit Manufacturing Company. Streamlined diffuser plate for a baseboard heater. 3,815,670, Cl. 165-55.000.
Shroff, Shrenik: *See*—
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,816,169.
Shrum, William M., to Mexton Manufacturing Company. Seismic sensing apparatus. 3,815,710, Cl. 187-29.00r.
Shuman, Dennis A.; and Robins, Roland K., to International Chemical & Nuclear Corporation. 2'-O-Methyladenosine 3',5'-cyclic phosphate. 3,816,400, Cl. 260-211.50r.
Siddall, John B., to Zolcon Corporation. Esters of phenyl ethers. 3,816,514, Cl. 260-488.000.
Sidey, Michael: *See*—
Sidi, Henri; and Sidey, Michael, 3,816,523.
Sidi, Henri; and Sidey, Michael, to Tenneco Chemicals, Inc. Process for the production and purification of benzoic acid. 3,816,523, Cl. 260-524.00r.
Siegel, Maxwell E.: *See*—

Rapoza, Edward J.; Siegel, Maxwell E.; Estelle, Weems E.; Petrucci, Pasquale M.; Linarducci, Joseph S.; Hamma, John; and Montgomery, John, 3,815,769.

Siemens Aktiengesellschaft: *See—*
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Sierracin Corporation, The: *See—*
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Signet Controls Incorporated: *See—*
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Silverstri, Anthony J.: *See—*
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Simmers, Charles F., to Pollock, Mayer, Steel Corporation. Shear and hold down device. 3,815,492, Cl. 100-95.000.

Simonovitch, Chaim: *See—*
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Simpson, Charles William, to Rocla Concrete Pipes Limited. Concrete pipe with splayed socket. 3,815,641, Cl. 138-155.000.

Singer Company, The: *See—*
Bullard, Russell H.; Lloyd, Robert M.; and Zipser, David B., 3,815,672.
Fromknect, Charles Thomas; and Harbeck, Martin Edward, 3,815,172.
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Weisz, William; and Odermann, Charles R., 3,815,532.
Wurst, John W.; and O'Brien, James E., 3,815,531.

Singer, Paul A., to Cincinnati Time Recorder Company, The. Automatic fee determining and receipt totalizing system for parking facilities. 3,815,718, Cl. 194-1.00n.

Singer-General Precision, Inc.: *See—*
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Sirocka, Richard L.; and Broxterman, David F., to Cal-Tex Semiconductor, Inc. Electronic watch. 3,815,354, Cl. 58-50.00r.

Sirovatka, George J.: *See—*
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Skeels, Gary W., Jr.: *See—*
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Skeen, Gary Robert, to Pace, Anthony and Pace, Virginia. Picker stick check mechanism. 3,815,644, Cl. 139-162.000.

SKF Industrial Trading and Development B.V.: *See—*
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Skidmore, Frank O. System for wheel balancing. 3,815,425, Cl. 73-457.000.

Skiles, David O.: *See—*
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Skinner, Kenneth Romayn, to Magnavox Company, The. Automatic focus control for image pickup devices. 3,816,848, Cl. 358-47.000.

Skirpan Lighting Control Corporation: *See—*
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Skirpan, Stephen J., to Skirpan Lighting Control Corporation. Solid state electronic dimmer. 3,816,797, Cl. 315-291.000.

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Skorecki, Jan; and Wheble, Victor Henry, to National Research Development Corporation. Prosthetic shoulder joint devices. 3,815,157, Cl. 3-100.000.

Skuce, William Frederick; Spence, David Hugh; and Whitefoot, Stuart Anthony, to Imperial Chemical Industries Limited. Manufacture of dyestuff powders. 3,815,252, Cl. 34-8.000.

Skurkiss, Peter Kenny: *See—*
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Sky Pole Manufacturing, Inc.: *See—*
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Slade, John Derek: *See—*
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Slawson, Kenneth Leonard, to Houdaille Industries, Inc. Machine tool data system and method. 3,816,723, Cl. 235-151.110.

Slawson, Richard S.; and Nazareth, Alfred, Jr., to Dahl, G. W., Co., Inc. and Variable level noise barrier circuit responsive to a bipolar input and having variable bipolar hysteresis and having a bipolar output. . 3,816,760, Cl. 307-235.00r.

Slykhouse, Thomas E.: *See—*
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Smalley, Edmund Walter: *See—*
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Smart, Bruce E., to Du Pont de Nemours, E. I., and Company. Perfluoromethylenecyclopropane. 3,816,553, Cl. 260-648.00f.

Smart, Ted; and Witt, Paul R., Jr., to Bowl-O-Beauty Co. Floral display. 3,816,224, Cl. 161-26.000.

Smialowicz, Edward H., to Garrett Corporation, The. Compensated pressure instrument. 3,815,417, Cl. 73-345.000.

Smierciak, Walter R., to Wilton Corporation. Band saw. 3,815,465, Cl. 83-820.000.

Smith, Beatrice A.: *See—*
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Smith, Dallas F., to General Electric Company. Wire protecting coil placing method and apparatus. 3,815,206, Cl. 29-205.00d.

Smith, David J., to Bard, C. R., Inc. Wheeled stretcher. 3,815,164, Cl. 5-81.000.

Smith, Edwin J.: *See—*
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Smith, Gordon, & Co., Inc.: *See—*
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Smith, Herchel: *See—*
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Smith, John H. Minimum tillage tool. 3,815,684, Cl. 172-694.000.

Smith, John J.: *See—*
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Smith, John W.: *See—*
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Smith, Joseph L., Jr.; and Thullen, Philip, to Massachusetts Institute of Technology. Rotor structure for supecooled field winding. 3,816,780, Cl. 310-52.000.

Smith, Richard Dale; and Broverman, Irwin. Processing copper base alloys. 3,816,187, Cl. 148-11.50r.

Smith, Ronald Gordon, to Bailey, W. H., Sir, & Co. Limited, mesne. Fluid-flow control valves. 3,815,869, Cl. 251-306.000.

Smith, Stanley E., to General Motors Corporation. Shielded instrument panel for use with a windshield radio antenna. 3,816,836, Cl. 343-713.000.

Smith, Stanley E., to General Motors Corporation. Instrument panel radio antenna. 3,816,837, Cl. 343-713.000.

Smith, Warren M., to Esso Research and Engineering Company. Flue gas desulfurization using surface impregnated sorbent. 3,816,597, Cl. 423-244.000.

Smithkline Corporation: *See—*
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Smiths Industries Limited: *See—*
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Snam Progetti, S.p.A.: *See—*
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Lugli, Gabriele; and Brandi, Bebriella, 3,816,372.
Paret, Giancarlo, 3,816,302.

Snape, Edwin, to International Nickel Company, Inc., The. Strong, corrosion resistant alloy. 3,816,106, Cl. 75-122.000.

Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., to Armstrong Cork Company, mesne. Apparatus for making hollow tubing having an annular wall of foamed material. 3,816,043, Cl. 425-4.00c.

Snitzer, Morton: *See—*
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Snyder, Carl R., to Esquire, Inc. High intensity, gas discharge lamp dimmer system. 3,816,794, Cl. 315-194.000.

Snyder, Donald. Method and apparatus for hemodialysis. 3,815,743, Cl. 210-94.000.

Snyder, H. Ben, to General Dynamics Corporation. Method of chemically forming wire. 3,816,273, Cl. 204-129.900.

Snyder, Kenneth F. Yieldable connector for exhaust pipe sections. 3,815,941, Cl. 285-283.000.

Sobieski, John C.: *See—*
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Societa Italiana Resine S.p.A.: *See—*
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Societe Anonyme dite: Societe Europeenne de Propulsion: *See—*
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Societe d'Etudes et de Recherches Schentifiques et Minieres: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
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Soltez, David Michael, to Rockwell International Corporation. Retail tool switch adaptor with key lock. 3,816,677, Cl. 200-42.00t.
Solvay & Cie: *See—*
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Johannessen, Jorgen Mosbaek, 3,815,748.
Sorensen, Sven Ake Lennart; and Valentin, Georg, to Hoganas AB. Sliding roof for a skylight opening provided in a building or over a court enclosed on all sides. 3,815,299, Cl. 52-66.000.
Sorgenti, Harold A., to Atlantic Richfield Company. Process for the desulfrization of hydrocarbons. 3,816,301, Cl. 208-208.00r.
Sorokin, Nikolai Elizarovich: *See—*
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Voronin, Mjud Izrailevich; Gnusarev, Gennady Petrovich; Mekler, Abram Grigorievich; and Sosedov, Viktor Ivanovich, 3,815,509.
Southworth Machine Company: *See—*
Atwood, Lamar T.; Radomski, Joseph E.; and Wilson, David E., 3,815,259.
Spacetac Incorporated: *See—*
Jehu, Robert Ramsay, 3,816,813.
Sparer, Seno: *See—*
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Sparlin, Derry D.: *See—*
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Powers, William R., 3,816,233.
Spector, Saul R.: *See—*
Gilfillan, William C.; and Spector, Saul R., 3,815,764.
Spedden, Henry Rush; and Malouf, Emil Edward, to Kennecott Copper Corporation. Controlled in-situ leaching of mineral values. 3,815,957, Cl. 299-5.000.
Spence, David Hugh: *See—*
Skuce, William Frederick; Spence, David Hugh; and Whitefoot, Stuart Anthony, 3,815,252.
Spencer, James M., Jr., to Sperry Rand Corporation. Cathode ray tube high speed electromagnetic deflection system. 3,816,792, Cl. 315-27.0td.
Sperry Rand Corporation: *See—*
Kroger, Harry; and Potter, Curtis N., 3,816,194.
Mast, Aquila D.; and Eggers, Edward T., 3,815,345.
Spencer, James M., Jr., 3,816,792.
Spiegelberg, Hans: *See—*
Edenhofer, Albrecht; Ramuz, Henri; and Spiegelberg, Hans, 3,816,434.
Spies, Henry J. Dispensing device. 3,815,787, Cl. 222-92.000.
Spinosa, Dom; Riely, Phyllis; and Hodgson, Fred, to East/West Medical Products, Inc., mesne. Retaining catheter. 3,815,608, Cl. 128-349.00r.
Spiroll Corporation Ltd.: *See—*
Lennox, Richard B., 3,815,370.
Spohr, Albert R.: *See—*
Waters, Robert S.; and Spohr, Albert R., 3,815,614.
Sporlan Valve Company: *See—*
Hoffman, John E.; and Schelich, Ardell J., 3,815,752.
Sportcraft, Inc.: *See—*
Murray, William B., 3,815,277.
Sprague Electric Company: *See—*
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Sprecher & Schuh Aktiengesellschaft: *See—*
Meier, Hans, 3,816,818.
Springer, Earl W. Automatic reset system for altitude encoding. 3,815,419, Cl. 73-384.000.
Springer, Earl W. Altitude encoder system with foot marker reset. 3,815,420, Cl. 73-384.000.
Sproul, John C.: *See—*
Hurlbut, Russell G.; Lindsay Donald J.; and Sproul, John C., 3,816,219.
Squibb, E. R., & Sons, Inc.: *See—*
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger Dieter, 3,816,414.
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger D., 3,816,444.
Squires, Jack E. Pipe joiner. 3,815,202, Cl. 29-200.00p.
Sramek, Bohumir. Depilatory method and means. 3,815,603, Cl. 128-303.180.
St. Regis Paper Company: *See—*
Perrin, Ronald, 3,815,801.
Staal, Gerardus B.: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,816,501.
Stach, Leonard J.: *See—*
Richter, Sidney B.; and Stach, Leonard J., 3,816,620.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, to Boehringer Ingelheim GmbH. 2,3-Dihydro-oxoimidazo(1,2-a)pyrimidines and salts. 3,816,422, Cl. 260-256.40f.
Stamicarbon N.V.: *See—*
Van Poelvoorde, Edward; and Van Der Zalm, Hendrikus, 3,816,503.
Stanadyne, Inc.: *See—*
Janik, Lee P., 3,816,040.
STanaitis, Peter P., to Textron Inc. Pre-assembled terminal screw and washers and method of manufacture. 3,816,820, Cl. 339-263.00r.
Standard Oil Company, The: *See—*
Selover, Theodore B.; Rightmire, Robert A.; and Regan, Philip R., 3,816,242.
Stanley Tools Limited: *See—*
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Russell, Edward David; and Shelton, George William Ronald, 3,815,190.
Stanray Corporation: *See—*
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Stapert, James, Jr.: *See—*
Roodvoets, Roger J.; and Stapert, James, Jr., 3,815,250.
Starks, Charles M., to Continental Oil Company. Telomer from alkyl acrylate or methacrylate and sulfuryl halide. 3,816,512, Cl. 260-485.00h.
Staub, Charles H., Jr., to Mine Safety Appliances Company. Closed circuit breathing apparatus. 3,815,592, Cl. 128-142.000.
Stauffer Chemical Company: *See—*
Mihailovski, Alexander; and Pallos, Ferenc M., 3,816,541.
Pallos, Ferenc M.; and Menn, Julius J., 3,816,502.
Teach, Eugene G., 3,816,498.
Teach, Eugene G., 3,816,527.
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Walker, Francis Harry, 3,816,436.
Stauffer Chemical Company, mesne: *See—*
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Mooring, Scott W., 3,815,169.
Steckler, Robert; Folliot, John M.; and Warren, Morris J., to Alcolac Inc. Alkyl aromatic polysulfonate surfactants. 3,816,354, Cl. 252-558.000.
Stedman, Robert N.: *See—*
Moser, Raymond L.; and Stedman, Robert N., 3,815,765.
Stedman, Robert N.; and Boggs, Roger L., to Caterpillar Tractor Company. Track links for cushion track. 3,815,962, Cl. 305-19.000.
Stein, Jeffrey P., to Honeywell Inc. Memory protecting circuit. 3,816,768, Cl. 307-296.000.
Steinberger, Josef; and Pohl, Heinz, to Forkardt, Paul, Kommanditgesellschaft. Power operable chuck. 3,815,929, Cl. 279-4.000.
Steinbrenner, Hans-Gunter: *See—*
Eschenbacher, Rolf; and Steinbrenner, Hans-Gunter, 3,815,435.
Stelter, William M. Sonic-wave fuel air homogenizing device. 3,815,565, Cl. 123-141.000.
Stepan Chemical Company: *See—*
Lemberg, Seymour; and Cain, Audley L., 3,816,534.
Stephens, Robert D.; and Kray, William C., Jr., to Shell Oil Compnay. Metal-compound filled poly(o-phenylene carbide) or poly(m-phenylene carbide) and carbon made therefrom. 3,816,345, Cl. 252-478.000.
Steppan Chemical Company: *See—*
Wechsler, Joseph R., 3,816,485.
Sterling, Remko C. Apparatus for removing foreign objects from tire threads. 3,815,447, Cl. 81-3.00r.
Sterner, Nils Olov Bruno: *See—*
Hernestam, Sven Erik Harry; Sterner, Nils Olov Bruno; and Lassen, Jorgen Buus, 3,816,433.
Steuler Industriewerke G.m.b.H.: *See—*
Kotting, Wolfgang; and Zakrezewski, Erhard, 3,815,334.
Stevens, J. P., & Co., Inc.: *See—*
Burgess, Jack Ashley, 3,815,814.
Stevens, John N., to Catug Corporation. Single hull tug and barge construction. 3,815,539, Cl. 114-235.00r.
Stevens, Robert T., to American Home Products Corporation. Scored tablet breaker. 3,815,802, Cl. 225-93.000.

Stewart, Donald Fergusson; and Pollard, Leslie John, to ICI Australia Limited. Process for producing metallic iron concentrates and titanium oxide concentrates from titaniferous ores. 3,816,099, Cl. 75-1.000.

Stinsa, Ernest E. Fuel injection system for multiple cylinder internal combustion engine. 3,815,563, Cl. 123-139.00r.

Stoia, Harry J. Lock. 3,815,390, Cl. 70-134.000.

Stokes, Bennie J. Radiator cleaning tank. 3,815,616, Cl. 134-105.000.

Stokes, James D., to Goodyear Tire & Rubber Company, The. Tire building method and machine. 3,816,202, Cl. 156-123.000.

Stolov, Michael. Illuminating device. 3,816,739, Cl. 140-10.00r.

Stormer, Joseph R., to General Motors Corporation. Method for manufacturing welded piston shock absorbers. 3,816,701, Cl. 219-152.000.

Story, Samuel M. Saw apparatus particularly useful in cutting rock. 3,815,570, Cl. 125-14.000.

Stotko, Norbert Anthony, to National Petro-Chemicals Corporation, mesne. Separation of olefin polymers. 3,816,383, Cl. 260-94.90f.

Stotz & Co.: *See*—
Koula, Zdenek, 3,815,552.

Strackbein, Gilbert E. Modulus 10 numbering machine. 3,815,495, Cl. 101-76.000.

Stracke, Wilfried, to Brown Boveri & Company Limited. Process for operating a gas-cooled nuclear reactor with a stanfpipe plug having coolant flow there through. 3,816,244, Cl. 176-60.000.

Straitz, John F., III, to Combustion Unlimited, Incorporated. Ignition apparatus for flare stacks and the like. 3,816,059, Cl. 431-278.000.

Strang, Elmer J.: *See*—
Scott, Ray A.; Bossard, Fredrick R.; Strang, Elmer J.; and Mikovits, John L., 3,815,653.

Strasser, Rudolf: *See*—
Nitzsche, Siegfried; Strasser, Rudolf; Leser, Robert; and Helmut, Spork, 3,816,493.

Strauff, Gunther, to Langen & Co. Automatic-functioning breather device. 3,816,030, Cl. 417-299.000.

Streander, George W., to Design Systems, Inc. Drafting device. 3,815,245, Cl. 33-27.00f.

Streck, Poland: *See*—
Nordsiek, Karl-Heinz; and Streck, Poland, 3,816,358.

Streck, Roland; and Weber, Heinrich, to Chemische Werke Huls, A.G. Polyalkenamers and process for the preparation thereof. 3,816,382, Cl. 260-93.100.

Streck, Roland; and Weber, Heinrich, to Chemische Werke Huls Aktiengesellschaft. Polyalkenamers and process for the preparation thereof. 3,816,384, Cl. 260-677.00r.

Streeter, John H.; and Jenkins, Roger M., to Revenue Systems Limited. Data processing apparatus. 3,815,719, Cl. 194-4.00g.

Stretanski, Joseph Anthony; and Hoffman, Joseph Adrian, to American Cyanamid Company. Nickel cyclohexylamine complexes of 2,2'-thiobis (p-alkylphenol) and use in polyolefins. 3,816,492, Cl. 260-439.00r.

Strobel, Roland; and Frerichs, Peter, to Olympia Werke AG. Reversible, frictional drive assembly. 3,815,430, Cl. 74-203.000.

Stromberg-Carlson Corporation: *See*—
Russell, Stanley L.; Gueldenpfenning, Klaus; and Pommerening, Uwe A., 3,816,665.

Strombert-Carlson Corporation: *See*—
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Stroot, Donald H.: *See*—
Collin, Henry A., Jr.; Eaton, James O.; Collin, Henry A., III; Pretzer, Jacob R.; and Stroot, Donald H., 3,815,683.

Struck, Bernd: *See*—
Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, 3,816,698.
Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, 3,816,699.

Strunc, Robert Winfield; and Young, Wray Bertram, to Chicago Bridge & Iron Company. Covered storage tank with means to suspend floating roof when not in use. 3,815,775, Cl. 220-26.000.

Strunk, Manfred: *See*—
Roh, Peter; and Strunk, Manfred, 3,815,505.

Stuart, Alexander: *See*—
Wood, Hamish Christopher Swan; and Stuart, Alexander, 3,816,450.

Studer, Rolf: *See*—
Gillessen, Dieter; Rudinger, Josef; and Studer, Rolf, 3,816,385.

Stumpe, Robert J., to Kimberly-Clark Corporation. Elastic nonwoven fabric. 3,816,228, Cl. 161-63.000.

Stumphauzer, William C.: *See*—
Horvath, Richard A.; Stumphauzer, William C.; Hogstrom, Edwin F.; and Rood, Alvin A., 3,816,165.
Rood, Alvin A.; Hogstrom, Edwin F.; and Stumphauzer, William C., 3,815,544.

Stut, Hans: *See*—
Drax, Heinz; and Stut, Hans, 3,816,650.

Substelny, Henry: *See*—
Malek, Walter K.; and Substelny, Henry, 3,815,657.

Suby, Duard J.: *See*—
Schmitz, James E.; and Suby, Duard J., 3,815,266.

Suda, Toshi; Akashi, Tetsuji; and Dohshita, Hidetoshi, to Nippondenso Co., Ltd. Fuel injection device for internal combustion engines. 3,815,564, Cl. 123-139.0ap.

Sugimoto, George. Applicator for liquids. 3,816,008, Cl. 401-157.000.

Sugiyama, Shinichi, to Kikkoman Shoyu Co., Ltd. Bacterial cellwall lytic enzyme and process for producing the same. 3,816,260, Cl. 195-62.000.

Suide, Haruo: *See*—
Yamano, Togo; Kanzaki, Toshihiko; Suide, Haruo; and Tsubaki, Keisuke, 3,816,257.

Sukenik, Robert J., to New Hudson Corporation. Glass lehr roll and method of manufacture. 3,815,197, Cl. 29-132.000.

Sullivan, Lawrence J. Bath lift apparatus. 3,815,163, Cl. 4-185.001.

Sulzbach, Reinhard A.; and Iqbal, Abul F. M., to Monsanto Company. Substituted 1,2-dihydropyridines and process for preparing same. 3,816,439, Cl. 260-294.900.

Sulzer Brothers Ltd.: *See*—
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Schneider, Hans, 3,816,111.

Sumitomo Chemical Company, Limited: *See*—
Yagi, Yoshiharu; Sato, Hiroshi; Narisawa, Shizuo; Yasui, Seimei; Kogayashi, Akiro; Hino, Minoru; and Hata, Kazuhiko, 3,816,567.

Sumitomo Electric Industries, Ltd.: *See*—
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Sun House A/S: *See*—
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Sun Oil Company of Pennsylvania: *See*—
Coppoch, Walter J.; Amaroso, James R.; and Griffith, John Q., III, 3,816,346.
Griffith, John Q., III; Williams, Edward S.; and Reiland, William H., Jr., 3,816,316.
Hansel, William B., 3,815,784.

Sunbeam Corporation: *See*—
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Sundstrand Data Control, Inc.: *See*—
Kirschner, Robert K., 3,816,005.

Suomen Sokeri Osakeyhtio (Finnish Suger Company): *See*—
Melaja, Asko J., 3,816,175.

Surowiec, Alfred J.: *See*—
Lofredo, Antony; and Surowiec, Alfred J., 3,815,376.

Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Murakami, Keiichi; and Ito, Humio, to Lion Fat & Oil Co., Ltd. Method for preparing a porous thermoplastic resin sheet. 3,816,575, Cl. 360-49.000.

Sutherland, Ivan E.; and Hodgman, Gary W., to Evans & Sutherland Computer Corporation. Computer graphics clipping system for polygons. 3,816,726, Cl. 235-152.000.

Sutherland, John A.: *See*—
Terry, Ruel C.; and Sutherland, John A., 3,815,678.

Sutliff, Wayne N.; and Downen, Jim L. Vacuum hdyrastitic jar accelerator. 3,815,693, Cl. 175-232.000.

Sutton, Blaine M., to Smithkline Corporation. Pyridyl ketipate lactones and derivatives. 3,816,440, Cl. 260-295.00r.

Suzuki, Kunihiko: *See*—
Morimoto, Yoshiro; and Suzuki, Kunihiko, 3,815,436.

Suzuki, Masaru; Iwata, Masayoshi; and Matsui, Takeo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Acceleration responsive switch. 3,816,680, Cl. 200-61.510.

Suzuki, Yasuo; and Oku, Tsuneo, to Hitachi, Ltd. Device for electrolytic grinder. 3,816,290, Cl. 204-218.000.

Swanson, Ralph G.; and Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Sealer composition of an acrylic-epoxy ester graft copolymer and an epoxy resin. 3,816,557, Cl. 260-837.000.

Swartout, Willson C.: *See*—
Dear, Terrence A.; Lechner, Alfred; and Swartout, Willson C., 3,816,713.

Swedish Health Products, Inc.: *See*—
Weiss, Marcel; and Kallus, Samuel, 3,815,904.

Sweet, Harold J.; Papworth, Robert L.; and Grimm, John G., Jr., to Marplex Products Company, Inc. and Herman Engineering Corporation. Log sorting method and apparatus. 3,815,738, Cl. 209-82.000.

Swift & Company: *See*—
Anderson, Harry T., 3,816,274.
Schack, Warren R., 3,816,633.

Swift, Paul F.: *See*—
Goffe, Charles A.; Henn, Richard W.; and Swift, Paul F., 3,816,136.

Swink, Marvin N.: *See*—
Ross, George F.; and Swink, Marvin N., 3,815,619.

Swinkels, Godefridus M.: *See*—
McKay, Donald R.; Swinkels, Godefridus M.; and Szarmes, Kornel R. V., 3,816,105.

Sygnator, Henry Anton, to Illinois Tool Works Inc. Die holder assembly. 3,815,166, Cl. 10-200.000.

Syracuse University Research Corporation: *See*—
Aldrich, Robert G.; Keller, Douglas V., Jr.; and Sawyer, Richard G., 3,815,826.

Szabados, Karoly: *See*—
Huszty, Denes; and Szabados, Karoly, 3,816,661.

Szabados, Lydia, nee Borbas. Kitchen utensils with removable grips. 3,815,175, Cl. 16-114.000.

Szarmes, Kornel R. V.: *See*—
McKay, Donald R.; Swinkels, Godefridus M.; and Szarmes, Kornel R. V., 3,816,105.

Szentmiklosi, Peter: *See*—
Schawartz, Jozsef; Szuts, Tamas; and Szentmiklosi, Peter, 3,816,411.

Szieleit, Hans J., to Esso Research and Engineering Company. Lubricant providing improved fatigue life. 3,816,313, Cl. 252-49.600.

Szuts, Tamas: *See*—
Schawartz, Jozsef; Szuts, Tamas; and Szentmiklosi, Peter, 3,816,411.

Tachibana, Koichi: *See*—
Mihara, Shigetoshi; Inaba, Yanosuke; Tachibana, Koichi; and Tomio, Endo, 3,816,389.
Tadanier, John Soloman; and Martin, Jerry Roy, to Abbot Laboratories. 11, 12-Epoxyerythromycins. 3,816,397, Cl. 260-210.00e.
Tadanier, John Soloman; and Martin, Jerry Roy, to Abbot Laboratories. 11-O-Methanesulfonylerythromycins. 3,816,398, Cl. 260-210.00e.
Tagalakis, Peter: *See*—
Pollock, William J.; and Tagalakis, Peter, 3,815,314.
Tailer, Peter L. Two color pen action. 3,816,006, Cl. 401-30.000.
Taiyo Shokai Co., Ltd.: *See*—
Aoko, Seiji; Kamiyana, Akira; and Yoshida, Tsugio, 3,816,210.
Takabayashi, Yoshikazu: *See*—
Hashimoto, Osamu; and Takabayashi, Yoshikazu, 3,816,573.
Takagi, Toru; Ochi, Osamu; and Mizushima, Yoshihiko, to Nippon Telegraph and Telephone Public Corporation. Semiconductor granules for use in acoustic-electro converting devices. 3,816,108, Cl. 75-134.00h.
Takahashi, Akio, to Hooker Chemical Corporation. Particle size control of bulk polymerized vinyl chloride polymers and copolymrs. 3,816,565, Cl. 260-884.000.
Takahashi, Hideo: *See*—
Maki, Yoshiyuki; Fujita, Masaru; Takahashi, Hideo; and Ino, Tetsuo, 3,816,178.
Takahashi, Takeshi; Yamazaki, Yoshio; Kato, Koichi; and Isono, Masao, to Takeda Chemical Industries, Inc. Method for the production of cephalosporins. 3,816,253, Cl. 195-29.000.
Takahashi, Yoshiro: *See*—
Kimura, Ichiro; Takahashi, Yoshiro; and Ito, Hideo, 3,816,500.
Takahataka, Masaharu: *See*—
Murata, Katsuhide; Takahataka, Masaharu; Kakutani, Kazuo; and Uedono, Sigezo, 3,816,256.
Takano, Hirotugu; and Inoue, Toshitsugu, to Matsushita Electric Industrial Co., Ltd. Automatic lathe. 3,815,453, Cl. 82-2.500.
Takata, Hiroshi: *See*—
Kagiya, Tsutomu; Mitsui, Hiroshi; Hosoi, Fumio; Fujimoto, Takahiko; Takata, Hiroshi; Tsuneta, Kazuyoshi; and Ushirokawa, Masahiro, 3,816,284.
Takeda Chemical Industries, Inc.: *See*—
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Takeda Chemical Industries, Ltd.: *See*—
Yamano, Togo; Kanzaki, Toshihiko; Suide, Haruo; and Tsubaki, Keisuke, 3,816,257.
Takegawa, Yukio; Matui, Takao; and Higuchi, Tetuya, to Oriental Photo Industrial Co., Ltd. Heat-developable light-sensitive materials. 3,816,132, Cl. 96-48.0hd.
Takei, Masuya, to Kuraray Co., Ltd. Method and apparatus for joining and cutting sheet materials. 3,816,216, Cl. 156-380.000.
Takeshi, Naruke: *See*—
Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; Naruke, Takeshi; Fumihiko, Morinaga; and Takeshi, Naruke, 3,816,629.
Takiron Co., Ltd.: *See*—
Iida, Kosuke; Kanada, Nobuo; and Kurita, Takeji, 3,815,640.
Tamny, Simon Z.: *See*—
Reighard, Alan B.; and Tamny, Simon Z., 3,815,788.
Tamulevich, Thomas W.; and Tominack, Ivan L., to United States of America, Navy. Rubber cellulosic tape sandwich inhibitor. 3,815,506, Cl. 102-103.000.
Tamura, Yoshitaka: *See*—
Nagasawa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; Obayashi, Tomokazu; and Mizota, Teruhiko, 3,816,174.
Nagaswa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; and Mizota, Teruhiko, 3,816,394.
Tamura, Zensuke: *See*—
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Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Tosa, Tetsuya; Sato, Tadashi; and Mori, Takao, 3,816,254.
Tanaka, Akihiro: *See*—
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Tanaka, Tokushirou: *See*—
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Tangen Drivers, Inc.: *See*—
Miller, Paul Marcus, 3,815,782.
Tanno, Kazunobu; and Ikeno, Yoichi. Process for producing L-lysine by fermentation. 3,816,255, Cl. 195-30.000.
Tantlinger, Keith W., to Rohr Industries, Inc. Side wall to floor joint for transportation type vehicle. 3,815,306, Cl. 52-285.000.
Tantlinger, Keith W., to Rohr Industries, Inc. Roof-to-side wall unit method joint structure for transportation type vehicles. 3,815,307, Cl. 52-285.000.
Tarabocchia, Martin. Light projection apparatus and method for photoprinting. 3,815,993, Cl. 355-78.000.
Tarutani, Satoshi, to Shimano Industrial Co., Ltd. Multi-speed transmission front gear system. 3,815,439, Cl. 74-611.000.
TATRA, narodni podnik: *See*—
Hlocky, Ladislav, 3,816,018.
Taub, Bernard, to Allied Chemical Corporation. Triethanolamine methylenedianiline curing agent and the process for using same in the manufacture of high resilent cold molded foam. 3,816,360, Cl. 260-2.5am.
Tauern, Dankmar. Methods and means for counting welding operations. 3,815,812, Cl. 235-92.0pd.
Taylor, Brian W.: *See*—
Kobylinski, Tadeusz P.; and Taylor, Brian W., 3,816,594.
Taylor, Dale F., to General Electric Company. Impedance controlled battery charger and method of charging with monitoring of A.C. answer signal. 3,816,807, Cl. 320-20.000.
Taylor, Keith M., to Monsanto Company. Ammoxidation of saturated hydrocarbons. 3,816,506, Cl. 260-465.300.
Taylor, Kenneth John: *See*—
Moulton, Alexander Eric; Uncles, Philip Basil; Slade, John Derek; and Taylor, Kenneth John, 3,815,885.
Taylor, Lynn J., to Owens-Illinois, Inc. Applying of pyrolyzable and polymeric material to substrate. 3,816,162, Cl. 117-46.0ca.
Taylor, Samuel, Pty., Limited: *See*—
Graham, Cecil Robert Montgomery; and Little, Lambert Ronald, 3,815,886.
Teach, Eugene G., to Stauffer Chemical Company. Meta-anilide urea compositions and their utility as herbicides. 3,816,498, Cl. 260-453.00r.
Teach, Eugene G., to Stauffer Chemical Company. Bis-meta-phenylene ureas and their utility as herbicides. 3,816,527, Cl. 260-552.00r.
Teets, Rodney J.: *See*—
Jennings, Rodney L.; Teets, Rodney J.; Kerby, Perry L.; and Moss, Charles H., 3,816,731.
Tegge, Bruce R.: *See*—
Rosenbaum, Barry M.; Tegge, Bruce R.; Faure, Jacques; and Love, James H., 3,816,379.
Teijeiro, Benito J. Calvino Y, to Magrini-Fabbriche Riunite Magrini Scarpa e Magnano M.S.M. S.p.A. Blast nozzle units with radial holes for self-blasting compressed gas electric circuit-breakers. 3,816,684, Cl. 200-148.00a.
Teleflex Incorporated: *See*—
Conrad, Winthrop B., 3,815,201.
Telektron Limited: *See*—
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Kainson, Anatoly Yakovlevich; Razygraev, Jury Sergeevich; Sorokin, Nikolai Elizarovich; Dobrokhotov, Sergei Alexandrovich; Sokolov, Veniamin Prokofievich; Zaitsev, Nikolai Ivanovich; Zandman, Boris Genikhovich; Telyatnikov, Boris Peisakhovich; Kholin, Nikoai Dmitrievich; and Ryazanov, Alexei Nikolaevich, 3,815,525.
Tenneco Chemicals, Inc.: *See*—
Minieri, Pasquale P., 3,816,447.
Sidi, Henri; and Sidey, Michael, 3,816,523.
Tenney, William L. Scavenge porting system. 3,815,558, Cl. 123-73.00a.
Tennyson, Roderick C. Process for the manufacture of cylinders. 3,816,582, Cl. 262-255.000.
Teodorescu, Constantin Gh.; Ceauselu, Constantin Octavian; and Ioanitescu, Sorin, to Institutul Pentru Creatie Stiintifica si Technica Increst. Process and device for gaso-dynamic ventilation. 3,815,487, Cl. 98-43.000.
Terakawa, Kazuo: *See*—
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Yokosuka, Satosh, 3,816,787.
Terry, Ruel C.; and Sutherland, John A., to Allied Chemical Corporation. Hydrocarbon sweep process. 3,815,678, Cl. 166-272.000.
Terry, Stanley M., to Maremont Corporation. Dual battery electrical system for internal combustion engine. 3,816,805, Cl. 320-15.000.
Texaco Development Corporation: *See*—
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Texaco Inc.: *See*—
Blanke, James F.; and Christopher, Charles A., Jr., 3,815,679.
Coleman, Richard L.; Cummins, Billy H.; and Shillinglaw, John P., Jr., 3,816,295.
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Morduchowitz, Abraham; and Rubin, Isaac D., 3,816,315.
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STanaitis, Peter P., 3,816,820.
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Huffman, Fred N.; and Hagen, Kenneth G., 3,815,363.

Thettu, Raghulinga R.; and Kocher, Haribhajan S., to Xerox Corporation. Xerographic fixing device. 3,816,066, Cl. 432-228.000.

Thiokol Chemical Corporation: *See—*
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Thomas, Hugh: *See—*
Morris, Arthur; and Thomas, Hugh, 3,816,340.

Thomas, Ieuan; and Traynor, James Rodney, to Imperial Chemical Industries Limited. Process for thr preparation of polyamides with alkali metal dihydrogen orthophosphate as catalyst. 3,816,369, Cl. 260-78.00r.

Thompson, Lawson B. Street drain for use with a sewer system. 3,815,749, Cl. 210-163.000.

Thompson, Richard L., to PHD, Inc. Compound motion fluid actuator. 3,815,479, Cl. 92-2.000.

Thomson, Kenneth W.: *See—*
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Thomson-CSF: *See—*
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Thornton, Leonard: *See—*
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Thune-Euraka A/S: *See—*
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Thurston, James R., to Thiokol Chemical Corporation. Ignition system for rockets. 3,815,359, Cl. 60-254.000.

Thust, Walter; and Schmidt, Uwe J., to U.S. Philips Corporation. Method and arrangement for optically displaying characters constituted by raster light spots on a projection surface. 3,816,824, Cl. 340-324.0ad.

Tieben, Heinz, to Diehl. Method of making splinter shells, and splinter projectiles and splinter heads made according to this method. 3,815,504, Cl. 102-67.000.

Tietze, Armin Rudolf, to International Business Machines Corporation. Surface contrast system and method. 3,815,998, Cl. 256-120.000.

Tillou, Frank Macomb: *See—*
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Timberlake, Thomas E.: *See—*
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Time Modulation (Proprietary) Limited: *See—*
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Ting, Philip; and Litle, Robert L., to Beckman Instruments, Inc. Scintillation counting systems and components. 3,816,743, Cl. 250-364.000.

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Toedtman, John August; and Cooper, James Joseph, Jr., to International Telephone and Telegraph Corporation. Flexible insulating sheath for direct buried power lines. 3,816,642, Cl. 174-138.00f.

Tokoro, Hirokazu: *See—*
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Toledo, Emil; Dzwonczyk, Luke; and Mo, Roger Shih-Yah, to Raytheon Company. Protective coating on wire. 3,816,185, Cl. 148-6.240.

Tominack, Ivan L.: *See—*
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Tomozawa, Atsushi; and Ford, Harold E., to Communications Satellite Corporation. System for changing the burst format in a TDMA communication system. 3,816,666, Cl. 179-15.0bs.

Torney, Harry L., to Johnson & Johnson, mesne. Culture medium foi leptospira organisms. 3,816,261, Cl. 195-96.000.

Tosa, Tetsuya: *See—*
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Tourtellier, Jean-Louis, to Tourtellier S.A. Monorail points. 3,815,510, Cl. 104-104.000.

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Trammell, Earl M., Jr. Litter container in an automobile seat assembly. 3,815,799, Cl. 224-42.42a.

Transfer Systems Incorporated: *See—*
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Traynor, James Rodney: *See—*
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Trecker, David John: *See—*
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Tribuno, Robert F.; and Foster, Jimmie L., to Collins Radio Company. Crab angle reference signal development for limited forward slip landing maneuver. 3,815,850, Cl. 244-77.00a.

Trimble, David C.: *See—*
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Tronche, Pierre A., to Ferlux. Organic salts of chromone-carboxylic-2-acids. 3,816,470, Cl. 260-345.200.

Trotel, Jacques; and Sigelle, Robert, to Thomson-CSF and Electronic devices for the programmed tracing of patterns. 3,816,719, Cl. 235-151.000.

Troxel Manufacturing Company: *See—*
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TRW Inc.: *See—*
Clifford, Richard P., 3,816,772.

Ts'Ao, Si-Ling. Automatic telephone dialer with three-dimensional conductive matrix switch assembly. 3,816.676, Cl. 200-1.00r.

Tsilibes, George N.: *See—*
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Tsubaki, Keisuke: *See—*
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Tsuchihara, Toyoji; Yawaka, Youhei; and Noguchi, Takeshi, to Showa Denko Labushiki Kaisha and Process of preparing stable aqueous ethylene vinyl ester copolymer emulsions. 3,816,362, Cl. 260-17.00a.

Tsuji, Nobuo: *See—*
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Tsujihata, Keiji; Sawada, Yasuhiro; Ishikawa, Yasushi; Matsubara, Mitsuteru; and Iwata, Minoru. Method of controlling a sintering process having a cooling zone. 3,816,096, Cl. 75-5.000.

Tsujimoto, Hideyuki: *See—*
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Tubeuf, Jean Andre Georges, to Societe Anonyme dite: Societe Europeenne de Propulsion. Hydraulic heat engine. 3,815,555, Cl. 123-19.000.

Tulk, George M. Vise. 3,815,892, Cl. 269-75.000.
Turecek, Joseph L.: *See—*
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Turley, John W.: *See—*
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Turner, Jerry Brent. Pipeline forced air convective heat transfer system. 3,815,671, Cl. 165-47.000.
Turner, Joe D. Fence panel construction. 3,815,877, Cl. 256-24.000.
Turner, Peter Raymond, to Molins, Limited. Calculating apparatus. 3,816,721, Cl. 235-151.130.
Turner, William M., to Golf Products, Inc. Golf club sole plate. 3,815,921, Cl. 273-174.000.
Turzillo, Lee A. Method for installing concrete anchor piles in situ. 3,815,368, Cl. 61-35.000.
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Bondarev, Vitaly Petrovich; Tusunian, Georgy Varlamovich; Budenny, Genady Georgievich; Mgeladze, Nodar Vladimirovich; Anisimov, Andr Vladimirovich; Saradzhev, Georgy Mikhailovich; Shakhbudagian-Shou, Suren Emmanuilovich; and Oringolts, Leonid Vladimirovich 3,815,745.
Tyree, Lewis, Jr. System for cooling material using CO_2snow. 3,815,377, Cl. 62-62.000.
U. S. Amada, Ltd.: *See—*
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Ueda, Kenji; and Tanaka, Akihiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Electrode construction and method of making an electrode. 3,816,293, Cl. 204-290.00r.
Uedono, Sigezo: *See—*
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Uetrecht, Dale M., to Baldwin, D. H., Company. Single master tone generator. 3,816,635, Cl. 84-1.010.
Uhlir, Pavel, to Elitex, Zavody textilniho strojirenstvi, generalni reditelstvi. Arrangement for mounting sinkers in a circular knitting machine. 3,815,382, Cl. 66-14.000.
Uhlmann, Ernest A.: *See—*
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Ulert, Izaak A. Expansible mobile home. 3,815,949, Cl. 296-23.00c.
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National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Clemons, Paul W. Device for configuring multiple leads. 3,815,205, Cl. 29-203.0mw.
Cowan, James J. Holography utilizing surface plasmon resonances. 3,815,969, Cl. 350-3.500.
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Urban, Leonard. Welding jig. 3,815,890, Cl. 269-43.000.
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Van Duuren, Kars; and Verhoeven, Adrianus Cornelis Johannes, 3,816,087.
Usami, Seiji; Nishimura, Kotaro; and Fukushi, Saburo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for preparing a catalytic cobalt carbonyl reaction product. 3,816,337, Cl. 252-414.000.
Ushirokawa, Masahiro: *See—*
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Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Substituted-desa-pregnanes and desa-pregnenes. 3,816,459, Cl. 260-340.900.
Uvarov, Jury Petrovich; and Gurevich, Rem Iosifovich. Air flotation machine. 3,815,739, Cl. 209-170.000.
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Vacuum thread trimmer: *See*—
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Van Duuren, Kars; and Verhoeven, Adrianus Cornelis Johannes, to U.S. Philips Corporation. Method of interconnecting glass parts by passing through electric current. 3,816,087, Cl. 65-40.000.
Van Dyk, Garritt C., Jr., to Con-Ray, Inc.; a subsidiary of Red-Ray Manufacturing Company, Inc. Food processing apparatus. 3,815,488, Cl. 99-339.000.
Van Gelder, Arthur. Method for vacuum dehydration. 3,815,251, Cl. 34-5.000.
Van Horn, Charles A., to Chemetron Corporation. Method and apparatus for controlling heat effect in metal cutting operations. 3,815,883, Cl. 266-23.00t.
Van Poelvoorde, Edward; and Van Der Zalm, Hendrikus, to Stamicarbon N.V. Process for preparing cyanoethylated ketones. 3,816,503, Cl. 260-464.000.
Van Vliet, Edward; and Dostmann, William R., to Fluid Energy Processing & Equipment Company. Method and apparatus for grinding thermoplastic material. 3,815,833, Cl. 241-5.000.
Vandergeeten, Albert Emile Isidore Marcel, to Vickers-Vandergeeten Societe Anonyme. Basket for a bottle washing machine. 3,815,758, Cl. 211-74.000.
Vanderpoel, Albert G. H. Filter construction. 3,815,744, Cl. 210-94.000.
Variable level noise barrier circuit responsive to a bipolar input and having variable bipolar hysteresis and having a bipolar output: *See*—
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Varley, R. F., Co., Inc.: *See*—
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Varley, Robert F.; and Varley, R. F., Co., Inc. Hydraulically enhanced well drilling technique. 3,815,692, Cl. 175-65.000.
Varner, Wayne F., to Minnesota Mining and Manufacturing Company. Multitube cable splice assembly and method of making same. 3,816,640, Cl. 174-73.00r.
Vasiliev, Vladimir Pavlovich; Glukhovskoi, Boris Mikhailovich; Golubovsky, Oleg Mikhailovich; Kufal, Georgy Eduardovich; and Pliev, Leonid Filippovich. Photo-detector. 3,815,977, Cl. 350-286.000.
Vass, Alexander A.; and Vass, Clara. Instrument for administering fluid into a body through an office therein. 3,815,598, Cl. 128-245.000.
Vass, Clara: *See*—
Vass, Alexander A.; and Vass, Clara, 3,815,598.
Vassilevsky, Anatole N.; deceased (by Vassilevsky, Irene; executrix), to V.R.B. Associates Inc. Light-weight high-strength cement compositions using hydrolyzed organic material. 3,816,147, Cl. 106-105.000.
Vassilevsky, Irene: *See*—
Vassilevsky, Anatole N., 3,816,147.
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, to Champion International Corporation. Fibrous and non-fibrous substrates coated with microcapsular opacifier system and the production of such coated substrated. 3,816,169, Cl. 117-155.00r.
Vaughan, Warren R.; and Borg-Warner (Canada) Ltd. Belt cleaning system. 3,815,728, Cl. 198-230.000.
Vecta Group, Inc., The: *See*—
Gibilterra, Charles A., 3,815,955.
Vedvik, Andrew H., to Oscar Mayer & Co., Inc. Means and method for unfolding bacon board flaps and the like. 3,815,319, Cl. 53-29.000.
Velsicol Chemical Corporation: *See*—
Hokama, Takeo, 3,816,561.
Richter, Sidney B.; and Stach, Leonard J., 3,816,620.
Vencent, Peter Incledon: *See*—
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vencent, Peter Incledon, 3,816,563.
Vencraft Corporation: *See*—
Gundlach, Robert W., 3,815,249.
Venobre, Henri: *See*—
Cayol, Andre; Chenal, Jean-Claude; Clottes, Georges; Schaller, Karl; Skok, Jean; and Venobre, Henri, 3,816,247.
Vereingte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Firma: *See*—
Warbichler, Peter, 3,816,190.
Vereinigte Aluminum-Werke Aktiengesellschaft: *See*—
Belsky, Milan, 3,816,605.
Verhoeven, Adrianus Cornelis Johannes: *See*—
Van Duuren, Kars; and Verhoeven, Adrianus Cornelis Johannes, 3,816,087.
Vertec Corporation: *See*—
Inglis, Leslie R., 3,815,375.
Vetter, Hans; and Meinhardt, Gunter, to Agfa-Gevaert Aktiengesellschaft. Marking ink and method of using the same. 3,816,144, Cl. 106-22.000.
Vickers-Vandergeeten Societe Anonyme: *See*—
Vandergeeten, Albert Emile Isidore Marcel, 3,815,758.
Victor Company of Japan, Ltd.: *See*—
Ohnuki, Katuhiro; Sato, Kazuhiro; Miyajima, Shin; and Hideo, Suyama, 3,816,774.
Vidovic, Nikola V., to Singer Company, The. Apparatus for providing sync pulses on a single conductor to a plurality of television cameras. 3,816,658, Cl. 178-69.5tv.
Viking Industries Inc.: *See*—
Iversen, Ralph T., 3,816,641.
Viland, Clare Kenneth. Method and appparatus for preventing loss of hydrocarbons to atmosphere. 3,815,327, Cl. 55-80.000.
Vitol, Matt J., to Becton-Dickinson and Company. Protective garments. 3,815,153, Cl. 2-51.000.
Viventi, Richard V., to General Electric Company. Radiation induced polymerization of polysiloxanes. 3,816,282, Cl. 204-159.130.
Vockenhuber, Karl: *See*—
Morell, Josef; Nowak, Johann; Schild, Josef; and Wessner, Harald, 3,815,847.
Vodoklys, Frank M., to Westinghouse Electric Corporation. Strontium halophosphate phosphor which incorporates a small amount of calcium. 3,816,327, Cl. 252-301.60p.
Volken, Kurt: *See*—
Wicht, Paul; and Volken, Kurt, 3,816,363.
Volkmar, Werner: *See*—
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Volkswagenwerk Aktiengesellschaft: *See*—
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Von Konig, Anita: *See*—
Kampfer, Helmut; Gotze, Johannes; Von Konig, Anita; and Ohlschlager, Hans, 3,816,131.
Von Strandtmann, Max; Cohen, Marvin P.; Klutchko, Sylvester; and Shavel, John, Jr., to Warner-Lambert Company. Flavanoid ring systems. 3,816,466, Cl. 260-345.200.
von Wald, Walter A., Jr.: *See*—
Marshall, Thomas E., III; and von Wald, Walter A., Jr., 3,815,413.
Vore, Herbert G., to Improved Machinery Inc. Low friction sealing means. 3,815,926, Cl. 277-34.000.
Voronin, Mjud Izrailevich; Gnusarev, Gennady Petrovich; Mekler, Abram Grigorievich; and Sosedov, Viktor Ivanovich. Apparatus for the automatic control of a monorail road. 3,815,509, Cl. 104-88.000.
Vovelle, Pierre G., to Thomson-CSF. Calendar indicator for time measuring systems. 3,815,351, Cl. 58-4.00a.
V.R.B. Associates Inc.: *See*—
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Vulcan Materials Company: *See*—
Hyatt, David E., 3,816,602.
Vulcan Plastics Inc.: *See*—
Churan, Roy G., 3,815,777.
Vyskumny ustav mechanizacie a automatizacie: *See*—
Duran, Ondrej; and Radic, Rudolf, 3,815,402.
Wachendorf, Friedrich; and Wehling, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Pivoting device for turbine housings of open-end spinning machines. 3,815,348, Cl. 57-58.890.
Wacker Chemie GmbH: *See*—
Nitzsche, Siegfried; Strasser, Rudolf; Leser, Robert; and Helmut, Spork, 3,816,493.
Waco Scaffold & Shoring Co., Division of Bliss & Laughlin Industries, Inc.: *See*—
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Wadley, Clark Searle: *See*—
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Wagensonner, Eduard, to Agfa-Gevaert Aktiengesellschaft. Motion picture fade-out and fade-in arrangement using a fluid crystal. 3,815,982, Cl. 352-91.000.
Waggon Union GmbH: *See*—
Schneider, Felix; and Kampmann, Gerhard, 3,815,518.
Wagner, Elmer R., to General Motors Corporation. Constant velocity universal joint gage. 3,815,381, Cl. 64-21.000.
Wagner, Joseph F., to Westinghouse Air Brake Company. Vehicle retaining arrangement for a monobeam type of transportation system. 3,815,513, Cl. 104-248.000.
Wahl, Josef; Moller, Heinz; Kammerer, Heinz; and Zechnall, Richard, to Bosch, Robert, GmbH. Ignition system for internal combustion engines. 3,815,560, Cl. 123-117.00r.
Waite, Ralph D.: *See*—
Harland, Philip W.; and Waite, Ralph D., 3,815,421.
Wakamatsu, Hachiro; and Shimomura, Koichi, to Ajinomoto Co., Inc. Process for producing methyl formate. 3,816,513, Cl. 260-488.00k.
Waldo, Russell W.: *See*—
Budd, Garland D.; Colombo, Gregory R.; and Waldo, Russell W., 3,816,686.
Walker, Edward, to Elbows Automatic Inc., mesne. Machine and method for forming tubular adjustable elbows. 3,815,394, Cl. 72-55.000.
Walker, Edward M.: *See*—
Toth, Julius; and Walker, Edward M., 3,816,171.

Walker, Francis Harry, to Stauffer Chemical Company. Pyridylmethylsulfinylcarbamates. 3,816,435, Cl. 260-294.80f.

Walker, Francis Harry, to Stauffer Chemical Company. Certain pyridylmethylsulfinylcarbamates. 3,816,436, Cl. 260-294.80f.

Walker, Helen H. Workpiece treatment machine with discharge means. 3,815,287, Cl. 51-13.000.

Walker, Jerome F.: *See—*
Russell, Jack A.; Walker, Jerome F.; and Hardenbrook, James M., 3,815,909.

Wallace, Harry L., to Burroughs Corporation. Endorsing apparatus. 3,815,497, Cl. 101-232.000.

Wallis, Craig; and Melnick, Joseph L., to Carborundum Company, The. Filtering method. 3,816,304, Cl. 210-36.000.

Wallshein, Melvin. Orthodontic biassing device. 3,815,237, Cl. 32-14.00a.

Wallshein, Melvin. Orthodontic end tube. 3,815,238, Cl. 32-14.00d.

Walsh, Myles A., to Eco-Control, Inc. Secondary cells and batteries. 3,816,177, Cl. 136-24.000.

Walters, Chester F., to Interstate Folding Box Company, The. Carton with integral reinforced handle. 3,815,809, Cl. 229-37.00e.

Walters, John P.; Goldstein, Steven A.; and Eaton, William S., to Wisonsin Alummi Research Foundation. Method and apparatus for spark spectroscopy by driving light from limited portions of the spark discharge. 3,815,995, Cl. 356-86.000.

Walton, Charles A., to Proximity Devices, Inc. Electronic recognition and identification system. 3,816,708, Cl. 235-61.11h.

Walton, Charles A. Electronic identification and recongnition system. 3,816,709, Cl. 235-61.11h.

Walton, Dan C., to Reliance Electric Company. Elevator controls for systems having widely spaced landings. 3,815,712, Cl. 187-29.00r.

Walus, Aloysius N.: *See—*
Swanson, Ralph G.; and Walus, Aloysius N., 3,816,557.

Wang, Tsih C.: *See—*
Dukowicz, John K.; Hoppie, Lyle O.; and Wang, Tsih C., 3,815,511.

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Warbichler, Barbara: *See—*
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Warbichler, Barbara, Jr.: *See—*
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Warbichler, Peter; deceased (by Warbichler, Barbara; Warbichler, Barbara, Jr.; Fraioli, Ingrid; and Warbichler, Peter, Jr.; heirs), to Vereingte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Firma. Method of heat-treatment of aluminum alloys. 3,816,19, Cl. 148-159.000.

Warbichler, Peter, Jr.: *See—*
Warbichler, Peter, 3,816,190.

Ward, Harold L., to Caterpillar Tractor Company. Air bleed liquid filter assembly. 3,815,746, Cl. 210-134.000.

Ward, John P.: *See—*
Molloy, Kenneth H.; Ward, John P.; and Benson, Mark, 3,816,796.

Warner Electric Brake & Clutch Company: *See—*
Eschenbacher, Rolf; and Steinbrenner, Hans-Gunter, 3,815,435.

Warner Lambert Company: *See—*
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Warner-Lambert Company: *See—*
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Warrington, Henry G., to Vulcan Iron Works Inc. Pile driving hammer. 3,815,474, Cl. 91-352.000.

Warwick Electronics, Inc.: *See—*
Nero, Leroy W.; and Merriweather, Kenneth A., 3,816,846.

Washall, Thomas A.; and Mameniskis, Walter A., to Atlantic Richfield Company. Purification of a material containing aldehyde impurities. 3,816,478, Cl. 260-348.00r.

Watanabe, Katsunori: *See—*
Matsumura, Yutaka; Nishifuji, Katsuyuki; Watanabe, Katsunori; and Matsuura, Kenji, 3,815,408.

Waters, Robert S.; and Spohr, Albert R., to Sunbeam Corporation. Reciprocating manicure device. 3,815,614, Cl. 132-75.000.

Watson, William David; and Kobel, Erwin H., to Dow Chemical Company, The. Stabilized distillation of pentachlorophenol. 3,816,268, Cl. 203-38.000.

Watt, William R., to American Can Company. Photopolymerizable epoxy systems containing nitrile gelation inhibitors. 3,816,278, Cl. 204-159.110.

Watt, William Russell, to American Can Company. Photopolymerizable epoxy systems containing cyclic amide gelation inhibitors. 3,816,280, Cl. 204-159.110.

Watts, Hargus, to Curtis-Wright Corporation. Gas filter assembly. 3,815,342, Cl. 55-493.000.

Watts, Lewis William, Jr., to Jefferson Chemical Company, Inc. Preparation of halogenated dicyanobenzenes. 3,816,505, Cl. 260-465.00g.

Waybright, George Cleveland: *See—*
Radloff, Harry John; and Waybright, George Cleveland, 3,816,793.

Wean United, Inc.: *See—*
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Weaver, Max A.: *See—*
Coates, Clarence A., Jr.; and Weaver, Max A., 3,816,391.

Weaver, Max A.; Pridgen, Herman S.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Azo compounds for alkyl alpha-aniline toluates. 3,816,388, Cl. 260-152.000.

Weaver, Max A., to Eastman Kodak Company. Benzothiazolyl-azo meta-acylamidoalkylene-aniline compounds. 3,816,390, Cl. 260-158.000.

Weaver, Max A.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Azo compounds containing a triazolylthio group. 3,816,392, Cl. 260-157.000.

Weber, Albrecht, to Maschinenfabrik Hilma Gesellschaft mit beschrankter Haftung. Vise. 3,815,889, Cl. 269-28.000.

Weber, Heinrich: *See—*
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Streck, Roland; and Weber, Heinrich, 3,816,384.

Weber, Helmut: *See—*
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Weber, Karl Heinz: *See—*
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Wechsler, Joseph R., to Steppan Chemical Company. Method of synthesizing fatty acid esters. 3,816,485, Cl. 260-410.90r.

Weck, Edward, & Company, Inc.: *See—*
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Chester, John E., 3,815,609.

Wehling, Rolf: *See—*
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Wehrman, Jesse, to Petro-Tex Chemical Corporation. Color stabilizer for maleic anahydride. 3,816,475, Cl. 260-346.800.

Weiberg, Otto: *See—*
Kleemann, Axel; Schreyer, Gerd; and Weiberg, Otto, 3,816,479.

Weigert, Wolfgang: *See—*
Schreyer, Gerd; Schwarze, Werner; Weigert, Wolfgang; and Horst, Weigel, 3,816,525.

Weiner, Myron Jerome; Pothoven, Floyd Rufford; and Johnson, Nolton Clement, Jr., to Union Carbide Corporation. Apparatus for facilitating laser scribing. 3,816,700, Cl. 219-121.00l.

Weinstock, Joseph, to Smithkline Corporation. 3-Heteroaryl- 2-thio-1,3-thiazane-2,4-diones having anti-arthritic activity. 3,816,627, Cl. 424-246.000.

Weir, Donald R.: *See—*
Mackiw, Vladimir N.; Weir, Donald R.; Evans, David J. I.; and Maschmeyer, Dennis G., 3,816,098.

Weise, George. Cleaning receptacle for restaurant exhaust hoods. 3,815,625, Cl. 137-376.000.

Weiss, Herbert: *See—*
Werdehausen, Achim; Weiss, Herbert; and Schutt, Hartwig, 3,816,483.

Weiss, Marcel; and Kallus, Samuel, to Swedish Health Products, Inc. Spring-type exercising device. 3,815,904, Cl. 272-82.000.

Weisz, William; and Odermann, Charles R., to Singer Company, The. Needle bar release and raising mechanisms. 3,815,532, Cl. 112-221.000.

Welcher, Richard Parke, to American Cyanamid Company. Production of β haloalkyl thiocyanates. 3,816,497, Cl. 260-454.000.

Welge, Frederick T.: *See—*
Redmore, Derek; and Welge, Frederick T., 3,816,184.

Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, to Hell, Rudolf, Dr. Ing., G.m.b.H. Arrangement for producing screened printing forms, such as printing cylinders, by means of an electron beam. 3,816,698, Cl. 219-121.0eb.

Wellendorf, Klaus; Padberg, Peter; and Struck, Bernd, to Hell, Rudolf, Dr. Ing., G.m.b.H. Engraving system for producing a screened rotary printing matrix with a variable diameter. 3,816,699, Cl. 219-121.0eb.

Weller, John J.: *See—*
Snelling, Charles D.; Andrews, Theodore E.; and Weller, John J., 3,816,043.

Wellman, Lester R. Opening and re-sealing device for bag containers. 3,815,810, Cl. 229-62.000.

Wellnitz, Jerry N., to Rohr Industries, Inc. Combined infrared and sound suppressor for aircraft jet engine. 3,815,360, Cl. 60-264.000.

Welty, Albert B., Jr., to Esso Research and Engineering Company. Process for decomposing ammonius sulfate into ammonius bisulfate and ammonia. 3,816,603, Cl. 423-520.000.

Wemyss, Anthony Charles: *See—*
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Wemyss, William Alexander; and Wemyss, Anthony Charles. Rotary flowmeter. 3,815,415, Cl. 73-231.00r.

Weninger, Gerhard, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. High power electric discharge lamp with cooled base assembly. 3,816,784, Cl. 313-32.000.

Wentworth, Firzwilliam Allan, to Cutler-Hammer, Inc. System for welding control. 3,816,724, Cl. 235-151.100.

Werdehausen, Achim; Weiss, Herbert; and Schutt, Hartwig, to Henkel & Cie GmbH. Carboxylic acid amide preparation. 3,816,483, Cl. 260-404.000.

Werkzeugmaschinenfabrik Adolf Waldrich Coburg: *See—*
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Werner, Bonin: *See—*
Horlein, Gerhard; Salbeck, Gerhard; Emmel, Ludwig; and Werner, Bonin, 3,816,456.

Werz, Siegfried; and Zanner, Johann, Jr., to Agfa-Gevaert Aktiengesellschaft. Motion picture camera with fading means. 3,815,981, Cl. 352-91.00s.

Wessner, Harald: *See*—
Morell, Josef; Nowak, Johann; Schild, Josef; and Wessner, Harald, 3,815,847.

Westaflexwerk L. & F. Westerbarkey, Firma: *See*—
Westerbarkey, Leonhard, 3,815,639.

Westerbarkey, Leonhard, to Westaflexwerk L. & F. Westerbarkey, Firma. Corrugated tubing. 3,815,639, Cl. 138-135.000.

Western Electric Company, Incorporated: *See*—
Andrews, Stephen Stewart, Jr.; Gawron, Louis, Jr.; and Meidl, Gary John, 3,816,674.
Kenney, John Thomas; and Litt, Frederic Alan, 3,816,329.

Westinghouse Air Brake Company: *See*—
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Almand, John Z., III, 3,816,801.
Lusby, Walter S., 3,816,610.
Ringler, Tim N.; and Santilli, James N., 3,816,800.
Toth, Julius; and Walker, Edward M., 3,816,171.
Traynor, Edward J., Jr.; and Hofmeister, Lawrence D., 3,816,477.
Vodoklys, Frank M., 3,816,327.

Weststrate, Willem J. J., to General Motors Corporation. Vehicle passive occupant restraining belt arrangement. 3,815,934, Cl. 280-150.0sb.

Westvaco Corporation: *See*—
Blume, William M., 3,816,241.

Wethington, Charles A., to Deering Milliken Research Corporation. Sealed edge machine. 3,816,215, Cl. 156-366.000.

Weyde, Edith; Scheibitz, Maria; and Meyer, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Process for the production of photographic images by modifying vesicular images. 3,816,133, Cl. 96-50.00r.

Weyer, Rudi; Aumuller, Walter; Schweitzer, Roland; Weber, Helmut; and Hubner, Manfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzenesulfonamidopyrimidines. 3,816,424, Cl. 260-256.50r.

Wheble, Victor Henry: *See*—
Skorecki, Jan; and Wheble, Victor Henry, 3,815,157.

Wheeler, Donald J.; and Lohrenz, Victor, to Guild Metal Joining Equipment Company. Strip shearing and welding apparatus. 3,816,696, Cl. 219-124.000.

Wheelwright, Robert W.: *See*—
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Whirlpool Corporation: *See*—
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Carr, Keith E.; and Johnson, Robert E., 3,815,171.
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White, Dwain M., to General Electric Company. Polyacetylenes. 3,816,374, Cl. 260-47.oua.

White, James A., to General Electric Company. Thermally responsive locking means for oven door latching mechanism. 3,815,942, Cl. 292-113.000.

White, Peter: *See*—
Rambusch, Viggo Beach; Oldenburg, Howard H.; and White, Peter, 3,816,740.

White, Rowland Kent; and Lindbeck, Simon Lloyd, to Telex Communications, Inc. Magnetic tape playing and changing apparatus. 3,816,851, Cl. 360-92.000.

White, Wilfrid Francis: *See*—
Hedlund, Marc Theodore; and White, Wilfrid Francis, 3,816,386.

Whitefield, J. Thomas, to Allen Organ Company. Electronic musical instrument with digital reverberation system. 3,816,637, Cl. 84-1.240.

Whitefoot, Stuart Anthony: *See*—
Skuce, William Frederick; Spence, David Hugh; and Whitefoot, Stuart Anthony, 3,815,252.

Whitehead Brothers Company: *See*—
Melcher, Ronald E., 3,816,145.

Whitman, Nelson, to Thor Dahl, Inc. Process and agents for opening paper constructions. 3,816,213, Cl. 156-344.000.

Wichinsky, Michael; and Laughton, Charles. Race game with preference for random winner related to randomly selected odds. 3,815,912, Cl. 273-86.00f.

Wicht, Paul; and Volken, Kurt, to Lonza Ltd. Saponification resistant, aqueous synthetic resin dispersion. 3,816,363, Cl. 260-17.00a.

Wiedmann, Siegfried K.: *See*—
Berger, Horst Heinz; and Wiedmann, Siegfried K., 3,816,758.

Wieg, Heinrich J. Apparatus for measuring displacement between two relatively movable members. 3,816,002, Cl. 356-169.000.

Wiig, Erling Ostratt. Ski arena. 3,815,901, Cl. 272-3.000.

Wilder, Thomas C., to Kennecott Copper Corporation. Method for determining the concentration of a metal in an alloy melt. 3,816,269, Cl. 204-1.00t.

Wilhelmy, Herbert, to Machine Tool Divisional Services Limited. Machine tools. 3,815,452, Cl. 82-2.000.

Wilk, Leonard S., to Massachusetts Institute of Technology. Pseudodiamagnetic suspension and pseudo-diadielectronic suspension. 3,815,963, Cl. 308-10.000.

Wilkinson, Geoffrey, to Du Pont de Nemours, E. I., and Company. Hexamethyltungsten. 3,816,491, Cl. 260-429.00r.

Wilkinson Sword Limited: *See*—
Hood, Christopher J., 3,815,227.

Wilkinson, William K., to Du Pont de Nemours, E. I., and Company. Fibers of cellulose ester having randomly distributed dicarboxylate half-ester, half-t-amine dye sites. 3,816,402, Cl. 260-225.000.

Williams, Chester I. Waler-positioning support for accummodating two dimensional standards in form lumber. 3,815,862, Cl. 249-40.000.

Williams, David John: *See*—
Rabin, Brian Robert; and Williams, David John, 3,816,263.

Williams, Edward S.: *See*—
Griffith, John Q., III; Williams, Edward S.; and Reiland, William H., Jr., 3,816,316.

Williams, Laurence Lyman: *See*—
Coscia, Anthony Thomas; and Williams, Laurence Lyman, 3,816,556.

Williams, Robert H.; Silverstri, Anthony J.; and Gorring, Robert L., to Mobil Oil Corporation. Catalytic oxidation process for isoparaffin hydrocarbons. 3,816,548, Cl. 260-632.00c.

Willinger, Allan H.; and Dinnerstein, Albert J., to Metaframe Corporation. Filtering device. 3,815,547, Cl. 119-5.000.

Wilson, David E.: *See*—
Atwood, Lamar T.; Radomski, Joseph E.; and Wilson, David E., 3,815,259.

Wilson, Harold F.; and McRae, Dougal H., to Rohm & Haas Company. Herbicidal 3,4-dichloroanilides. 3,816,092, Cl. 71-118.000.

Wilson, Harold R., to General Electric Company. Pattern machining system for die rolls. 3,815,288, Cl. 51-35.000.

Wilson, John S.; Clark, Willard F.; and Slykhouse, Thomas E., to Dow Chemical Company, The. Method of making calcium nitrate explosive composition. 3,816,191, Cl. 149-41.000.

Wilson, Raymond F.; Estes, John H.; and Kravitz, Stanley, to Texaco Inc. Production of alkylate. 3,816,294, Cl. 208-61.000.

Wilson, Robert C., to Martin Marietta Corporation. Electronic direction finder. 3,816,834, Cl. 343-113.00r.

Wilson, Steven J.: *See*—
Howard, Frank C.; and Wilson, Steven J., 3,815,475.

Wilson, Wendell B. Process for diffusion bonding. 3,815,219, Cl. 29-488.000.

Wilton Corporation: *See*—
Smierciak, Walter R., 3,815,465.

Winfield, Armand Gordon, to Burden, William A. M. Impact absorbing laminate and articles fabricated therefrom. 3,816,234, Cl. 161-160.000.

Winkowski, Daniel A.: *See*—
Dawdy, Jack A.; and Winkowski, Daniel A., 3,816,199.

Winter, William Robert; and Wadley, Clark Searle, to Abbott Laboratories. Disposable culture device. 3,816,264, Cl. 195-139.000.

Winther, Thorkil. Body-attachable steam pack cover. 3,815,610, Cl. 128-380.000.

Winzeler, James E.: *See*—
Gorrell, James M.; and Winzeler, James E., 3,815,445.

Wirth, Gary J., to Uniflo Systems Company. Proportional on/off valve. 3,815,866, Cl. 251-25.000.

Wise, Kenneth V., to Monsanto Company. Method of making a uranium-antimony oxide catalyst. 3,816,596, Cl. 423-253.000.

Wisonsin Alummi Research Foundation: *See*—
Walters, John P.; Goldstein, Steven A.; and Eaton, William S., 3,815,995.

Witt, Paul R., Jr.: *See*—
Smart, Ted; and Witt, Paul R., Jr., 3,816,224.

Wolf, Gerhard: *See*—
Dziomba, Willy; Beule, Rainer; Dreyer, Gunter; and Wolf, Gerhard, 3,815,620.

Wolfe, Robert T. Safe stove for campers. 3,815,572, Cl. 126-59.000.

Wolff, David F., to Yorktown Industries Inc. Means for controlling feeding of paper from rolls. 3,815,841, Cl. 242-75.400.

Wolfgarten, Hubert: *See*—
Meier, Fran; Ossendorf, Erich; and Wolfgarten, Hubert, 3,815,339.

Wondolowski, Lawrence: *See*—
Gibbons, John P.; and Wondolowski, Lawrence, 3,816,395.

Wood, Hamish Christopher Swan; and Stuart, Alexander, to Univeristy of Strathclyde, The. PPteridine derivatives and method. 3,816,450, Cl. 260-326.00a.

Wood, Loren E.: *See*—
Ludwig, Gary J.; and Wood, Loren E., 3,815,779.

Woodingham Investment Company, mesne: *See*—
Isaacson, Louis; and Herrin, Richard, 3,816,026.

Woodmont Industries, Inc.: *See*—
Carroll, Harvey F., 3,815,233.

Woods, Richard E.: *See*—
Haifley, William E.; Kennerk, Robert D.; and Woods, Richard E., 3,815,898.

Woods, William G. Fire retardant resins. 3,816,307, Cl. 252-8.100.

Woolslayer, Homer J., to Moore, Lee C., Corporation. Detachable pipe guides for pipe racking fingers. 3,815,757, Cl. 211-60.00r.

Works, George A., to Raytheon Company. Real time fourier transformation apparatus. 3,816,729, Cl. 235-156.000.

Worley, George W., to Troxel Manufacturing Company. Bicycle saddle. 3,815,953, Cl. 297-195.000.

Wrasidlo, Wolfgang J., to United States of America, Interior. Poly (N-amido) imides as semipermeable membranes. 3,816,303, Cl. 210-23.000.

Wren, Clifford T.: *See*—
Wren, Clyde E.; Wren, Julian C.; and Wren, Clifford T., 3,815,913.

Wren, Clyde E.; Wren, Julian C.; and Wren, Clifford T. Dual image alignment apparatus. 3,815,913, Cl. 273-101.200.
Wren, Julian C.: *See*—
Wren, Clyde E.; Wren, Julian C.; and Wren, Clifford T., 3,815,913.
Wright, James C.; and Reed, Reginald A., to Cutler-Hammer, Inc. Method and apparatus for transferring and storing articles. 3,815,723, Cl. 198-38.000.
Wright, John B., to Upjohn Company, The. 4-Oxo-4H-pyrano [3,2-b] benzofuran-2-carboxylic acids and salts thereof. 3,816,467, Cl. 260-345.700.
Wright, Leslie I.; and Fitzgerald, Jim W., to Portland Chain Manufacturing Co. Division of Webster Mfg., Inc. Method and apparatus for unwinding coiled material. 3,815,844, Cl. 242-128.000.
Wu, Yao-Hua; and Lobeck, Walter G., to Mead Johnson & Company. N-phenyl amidines. 3,816,454, Cl. 260-326.150.
Wurlitzer Company, The: *See*—
Machanian, William V.; and Wheelwright, Robert W., 3,815,720.
Wurst, John W.; and O'Brien, James E., to Singer Company, The. Sewing machine equipped with pulse generator. 3,815,531, Cl. 112-220.000.
Wurtz, Volkmar: *See*—
Pelster, Gerd; Wurtz, Volkmar; and Feess, Erich, 3,816,067.
Wuthrich, Paul; Reder, Rodney W.; and Rinaldi, Joseph, to Timex Corporation. Universal time watch. 3,815,353, Cl. 58-42.500.
Wynne, James J.: *See*—
Hodgson, Rodney T.; Lankard, John R.; Sorokin, Peter P.; and Wynne, James J., 3,816,754.
Wyslotsky, Ihor. Packaging machine. 3,815,322, Cl. 53-112.00a.
Xepex Industries, Inc.: *See*—
Jones, Charles Wright, 3,815,484.
Xerox Corporation: *See*—
Bresnick, Herbert L., 3,816,756.
Byrne, John F., 3,816,118.
Donohue, James M.; and Gerbasi, Dennis P., 3,816,157.
Esmay, Edward N., 3,815,380.
Fukushima, Osamu; Sato, Masamichi; and Matsumoto, Seiji (said Fukushima and said Matsumoto assors. to), 3,816,114.
Gundlach, Robert W.; and Bean, Lloyd F., 3,816,115.
Haas, Werner E. L.; Flannery, John B., Jr.; Mechlowitz, Bela; and Adams, James E., 3,816,113.
Hatzmann, John F., 3,815,899.
Hoyer, August, 3,815,896.
Lubicz, George S.; and Bills, Alan J., 3,816,288.
McCann, James J., 3,816,727.
McVeigh, James H.; and Tsilibes, George N., 3,815,988.
Thettu, Raghulinga R.; and Kocher, Haribhajan S., 3,816,066.
Yagi, Yoshiharu; Sato, Hiroshi; Narisawa, Shizuo; Yasui, Seimei; Kogayashi, Akiro; Hino, Minoru; and Hata, Kazuhiko, to Sumitomo Chemical Company, Limited. Process for producing butadiene polymer. 3,816,567, Cl. 260-94.300.
Yakubek, Louis P.; and Obenshain, George R., to Owens-Illinois, Inc. Glass heat treat machinery. 3,816,088, Cl. 65-244.000.
Yamaguchi, Tetsuo: *See*—
Nishiyama, Akira; Yoshino, Hirokazu; Yamaguchi, Tetsuo; Tsuboka, Eiichi; and Ohwaki, Haruki, 3,816,660.
Yamamoto, Mititaka; and Hayakawa, Fumio, to Omron Tateisi Electronics Co. Electronic calculator with an incorporated digital clock. 3,816,730, Cl. 235-156.000.
Yamano, Togo; Kanzaki, Toshihiko; Suide, Haruo; and Tsubaki, Keisuke, to Takeda Chemical Industries, Ltd. Method for producing cephalosporin C. 3,816,257, Cl. 195-36.00r.
Yamatani, Tetsuo: *See*—
Ariyoshi, Yasuo; Koguchi, Yohko; Yamatani, Tetsuo; and Koji, Toi, 3,816,471.
Yamato Sanko Mfg. Ltd.: *See*—
Yamato, Yukio, 3,815,255.
Yamato, Yukio, to Yamato Sanko Mfg. Ltd. Fluidized bed dryer. 3,815,255, Cl. 34-57.00d.
Yamazaki, Yoshio: *See*—
Takahashi, Takeshi; Yamazaki, Yoshio; Kato, Koichi; and Isono, Masao, 3,816,253.
Yamazaki, Yoshio, to Kabushiki Kaisha Suwa Seikosha. Liquid crystals stable against electrolytic decomposition and display device utilizing same. 3,816,334, Cl. 252-408.000.
Yard, William James. Ballast regulator control means. 3,815,268, Cl. 37-105.000.
Yasui, Seimei: *See*—
Yagi, Yoshiharu; Sato, Hiroshi; Narisawa, Shizuo; Yasui, Seimei; Kogayashi, Akiro; Hino, Minoru; and Hata, Kazuhiko, 3,816,567.
Yates, Paul Clifford, to Du Pont de Nemours, E. I., and Company. Coupling agent copolymer dispersions of silicic acids and organofunctional silanes. 3,816,152, Cl. 106-287.0se.
Yawaka, Youhei: *See*—
Tsuchihara, Toyoji; Yawaka, Youhei; and Noguchi, Takeshi, 3,816,362.
Yeh, Rudolph E.: *See*—
Carlson, Ernest C.; Brudnak, Andrew, Jr.; and Yeh, Rudolph E., 3,815,766.
Yokosuka, Satosh: *See*—
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Yokosuka, Satosh, 3,816,787.
Yoldas, Bulent E., to Owens-Illinois, Inc. Refractory article and method for producing same. 3,816,163, Cl. 117-46.0fa.
Yonezawa, Seiji; Iyama, Akiyoshi; Ito, Hisatsugu; and Kato, Keizo, to Hitachi, Ltd. Hologram reconstruction system. 3,816,243, Cl. 178-5.4cd.
Yorktown Industries Inc.: *See*—
Wolff, David F., 3,815,841.
Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, to Nippondenso Kabushiki Kaisha. Electrical fuel control system for internal combustion engines. 3,816,717, Cl. 235-150.210.
Yoshida Kogyo Kabushiki Kaisha: *See*—
Kawakami, Koichi, 3,815,208.
Sekine, Hiroyuki, 3,815,181.
Yoshida, Okio: *See*—
Shimizu, Kazuo; Yoshida, Okio; Terakawa, Kazuo; and Yokosuka, Satosh, 3,816,787.
Yoshida, Tsugio: *See*—
Aoko, Seiji; Kamiyana, Akira; and Yoshida, Tsugio, 3,816,210.
Yoshino, Hirokazu: *See*—
Nishiyama, Akira; Yoshino, Hirokazu; Yamaguchi, Tetsuo; Tsuboka, Eiichi; and Ohwaki, Haruki, 3,816,660.
Youmans, Albert P.: *See*—
Mitarai, Hajime; Nelson, Carroll E.; and Youmans, Albert P., 3,815,222.
Young, Frank G.; and Pennington, Leroy R., to Union Carbide Corporation. Catalytic process for hydration of olefins. 3,816,550, Cl. 260-641.000.
Young, Wray Bertram: *See*—
Strunc, Robert Winfield; and Young, Wray Bertram, 3,815,775.
Youngstown Steel Door Company: *See*—
Ross, Irving D., Jr., 3,815,515.
Younkin, Harry A., to Hercules Incorporated. Impulse control sensor system. 3,815,358, Cl. 60-234.000.
Yunaska, Matthew R.: *See*—
Lewis, Sheldon N.; and Yunaska, Matthew R., 3,816,168.
Zaba, Tadeusz: *See*—
Jampen, Ulrich; and Zaba, Tadeusz, 3,816,751.
Zackay, Victor F.: *See*—
Pickus, Milton R.; Parker, Earl R.; and Zackay, Victor F., 3,815,224.
Zaitsev, Nikolai Ivanovich: *See*—
Kainson, Anatoly Yakovlevich; Razygraev, Jury Sergeevich; Sorokin, Nikolai Elizarovich; Dobrokhotov, Sergei Alexandrovich; Sokolov, Veniamin Prokofievich; Zaitsev, Nikolai Ivanovich; Zandman, Boris Genikhovich; Telyatnikov, Boris Peisakhovich; Kholin, Nikoai Dmitrievich; and Ryazanov, Alexei Nikolaevich, 3,815,525.
Zakrezewski, Erhard: *See*—
Kotting, Wolfgang; and Zakrezewski, Erhard, 3,815,334.
Zandman, Boris Genikhovich: *See*—
Kainson, Anatoly Yakovlevich; Razygraev, Jury Sergeevich; Sorokin, Nikolai Elizarovich; Dobrokhotov, Sergei Alexandrovich; Sokolov, Veniamin Prokofievich; Zaitsev, Nikolai Ivanovich; Zandman, Boris Genikhovich; Telyatnikov, Boris Peisakhovich; Kholin, Nikoai Dmitrievich; and Ryazanov, Alexei Nikolaevich, 3,815,525.
Zanner, Johann, Jr.: *See*—
Werz, Siegfried; and Zanner, Johann, Jr., 3,815,981.
Zaweski, Edward F., to Ethyl Corporation. Process for making dialkoxyphenols. 3,816,542, Cl. 260-613.00d.
Zechnall, Richard: *See*—
Wahl, Josef; Moller, Heinz; Kammerer, Heinz; and Zechnall, Richard, 3,815,560.
Zeffren, Eugene; and Knohl, Richard B., to Procter & Gamble Company, The. Hair bleaching compositions and process. 3,816,614, Cl. 424-62.000.
Zeffren, Eugene; and Knohl, Richard B., to Procter & Gamble Company, The. Hair bleaching compositions and process. 3,816,615, Cl. 424-62 .000.
Zeile, Karl: *See*—
Bauer, Adolf; Weber, Karl Heinz; Merz, Herbert; Zeile, Karl; Giesemann, Rolf; and Danneberg, Peter, 3,816,409.
Zeiss-Stiftung, Carl d/b/a Carl Zeiss: *See*—
Herzog, Klaus, 3,816,712.
Zell, Howard C.; and Borick, Paul M., to Arbrook, Inc. N-Substituted azabicyclononanes. 3,816,407, Cl. 260-239.0ba.
Zenith Radio Corporation: *See*—
Lerner, Martin L., 3,816,214.
Zentz, William E., Jr., to Engelhard Minerals & Chemicals Corporation. Opacity of clay films. 3,816,153, Cl. 106-288.00b.
Zeta International Engineering, Inc.: *See*—
Bartley, John E., 3,815,807.
Zettel, Joseph H., to Johns-Manville Corporation. Hydrated calcium silicate products. 3,816,149, Cl. 106-120.000.
Ziegler, Hermann, to Porsche, Dr.-Ing., H.c.F., K.G. Profile strip for the mounting support of fixedly installed panes. 3,815,303, Cl. 52-99.000.
Zigerlig, Benno: *See*—
Bachmann, Robert; Buxbaum, Charley; and Zigerlig, Benno, 3,816,079.
Zinn, Harold; Schwartz, Martin L.; and Shavel, John, Jr. 4-Hydroxy-3-(3-isoxazolocarbamyl)-2H-1,2-benzothiazine 1,1-dioxides to treat inflammatory fever and pain conditions. 3,816,628, Cl. 424-246.000.
Zipser, Albert E. Tree stand. 3,815,854, Cl. 248-47.000.
Zipser, David B.: *See*—

Bullard, Russell H.; Lloyd, Robert M.; and Zipser, David B., 3,815,672.
Zoecon Corporation: *See*—
Henrick, Clive A., 3,816,484.
Henrick, Clive A.; and Staal, Gerardus B., 3,816,501.
Zolcon Corporation: *See*—
Siddall, John B., 3,816,514.
Zukowski, Ronald Joseph: *See*—
Landauer, Leroy; and Zukowski, Ronald Joseph, 3,816,289.
Zwiep, Theodore C.; and Denbleyker, John R. Orienting apparatus and method. 3,815,730, Cl. 198-287.000.
06/11/74; and Miller, Charles H. Odor elimination system. 3,816,073, Cl. 21-102.00r.
06/11/74; and Kino, Gordon S., to Leland Stanford Junior University, The Board of. Parametic acoustic surface wave apparatus. 3,816,753, Cl. 307-88.300.
06/11/74; and McMaster, Richard Louis, to Detection Systems, Inc. Cipher lock. 3,816,755, Cl. 307-115.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JUNE, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMF Inc.: *See*—
Hineline, Robert E. Re. 28,043.

Buzzi, Angelo, to Christian Holzapfel KG. Furniture for sitting. Re. 28,038, 6–11–74, Cl. 297—195.

Electro-Motion Pacific, Inc.: *See*—
Loffler, Erich W., and Kruger. Re. 28,041.

Grunwald, John J.: *See*—
Rhodenizer, Harold L., Grunwald, and Innes. Re. 28,042.

Grustin, Gerald M., and J. E. Logan. Bathroom scale with optically projected dial indicator. Re. 28,040, 6–11–74, Cl. 177—178.

Hineline, Robert E., to AMF Inc. Method of building a tire casing from a strip of rubber. Re. 28,043, 6–11–74, Cl. 156—117.

Holzapfel, Christian, KG.: *See*—
Buzzi, Angelo. Re. 28,038.

Innes, William P.: *See*—
Rhodenizer, Harold L., Grunwald, and Innes. Re. 28,042.

International Harvester Co.: *See*—
Ruhl, Charles A. L. Re. 28,039.

Kruger, Hans: *See*—
Loffler, Erich W., and Kruger. Re. 28,041.

LaPointe, Gabriel M., to Parker Mfg. Co. Easy release device for a socket wrench. Re. 28,037, 6–11–74, Cl. 81—61.

Loffler, Erich W., and H. Kruger, to Electro-Motion Pacific, Inc. Multiple stage extensible boom. Re. 28,041, 6–11–74, Cl. 240—3.

Logan, James E.: *See*—
Grustin, Gerald M., and Logan. Re. 28,040.

MacDermid Inc.: *See*—
Rhodenizer, Harold L., Grunwald, and Innes. Re. 28,042.

Parker Mfg. Co.: *See*—
LaPointe, Gabriel M. Re. 28,037.

Rhodenizer, Harold L., J. J. Grunwald, and W. P. Innes, to MacDermid Inc. Method of making additive printed circuit boards and product thereof. Re. 28,042, 6–11–74, Cl. 117—212.

Ruhl, Charles A. L., to International Harvester Co. Forward-reverse, steering, braking and motor control. Re. 28,039, 6–11–74. Cl. 180—6.660.

LIST OF PLANT PATENTEES

Barberet, Alexandre, to Laboratoire de Physiologie Vegetale de la Londe-Societe Civile Agricole. Carnation plant (Lonrina. 3,570, 6–11–74, Cl. 73.

Buckner, George, to Jackson & Perkins Co. Rose plant. 3,566, 6–11–74, Cl. 2.

Conard-Pyle Co., The: *See*—
Swim, Herbert C., and Weeks. 3,568.

Jackson & Perkins Co.: *See*—
Buckner, George. 3,566.
Warriner, William A. 3,569.

Laboratoire de Physiologie Vegetale de la Londe-Societe Civile Agricole: *See*—
Barberet, Alexandre. 3,570.

Slusarenko, Jack D., to Stark Bro's Nurseries & Orchards Co. Apple tree. 3,567, 6–11–74, Cl. 35.

Stark Bro's Nurseries & Orchards Co.: *See*—
Slusarenko, Jack D. 3,567.

Swim, Herbert C., and O. L. Weeks, to The Conard-Pyle Co. Rose plant. 3,568, 6–11–74, Cl. 11.

Warriner, William A., to Jackson & Perkins Co. Rose plant. 3,569, 6–11–74, Cl. 17.

Weeks, O. L.: *See*—
Swim, Herbert C., and Weeks. 3,568.

LIST OF DESIGN PATENTEES

Barrett, Edward E.: *See*—
Power, John J., Hurkmans, and Barrett. 231,767.

Baxter Laboratories, Inc.: *See*—
Seitz, Lamont J., and Hauser. 231,781.

Bernard, James K., T. F. Gary, and J. Cholakis, to International Playtex Corp. Milk case. 231,770, 6–11–74, Cl. D9—177.

Berry, Lois B., and S. Miller. Carryall for tennis equipment. 231,807, 6–11–74, Cl. D87—1.

Bloch, Jack, to Foster Grant Co., Inc. Spectacle front. 231,799, 6–11–74, Cl. D57—1.

Brudy, Peter E., to Dominion Auto Accessories Ltd. Combined bow and anchor lamp. 231,795, 6–11–74, Cl. D48—32.

Bruno, C., & Son, Inc.: *See*—
Hoey, Fred A. 231,797.

Burnley, Richard N. Display cover for an aquarium or similar article. 231,786, 6–11–74, Cl. D30—12.

Burnley, Richard N. Display cover for an aquarium or similar article. 231,787, 6–11–74, Cl. D30—12.

Carsello, Anthony, to Dream Flo Systems, Inc. Liquid concentrate and water mixing and dispensing spray gun. 231,782, 6–11–74, Cl. D23—18.

Center for New Product Development: *See*—
McLaughlin, James H. 231,774.

Chartier, Guy N., to Guy-Chart Tools Ltd. Coupling for chain and finger hook. 231,768, 6–11–74, Cl. D8—252.

Cholakis, John: *See*—
Bernard, James K., Gary, and Cholakis. 231,770.
Gary, Timothy F., and Cholakis. 231,771.

Cole, John D. Building structure. 231,779, 6–11–74, Cl. D13—1.

Construction Specialties, Inc.: *See*—
Hallock, Edward C. 231,780.

Continental Can Co., Inc.: *See*—
Mascia, Carmen T. 231,773.

Dazey Products Co.: *See*—
McNair, Samuel L. 231,802.
McNair, Samuel L. 231,804.

Dilyard, Richard D., to Rubbermaid Inc. Vacuum cleaner accessory rack. 231,761, 6–11–74, Cl. D6—136.

Dominion Auto Accessories Ltd.: *See*—
Brudy, Peter E. 231,795.

Dream Flo Systems, Inc.: *See*—
Carsello, Anthony. 231,782.

Family Products Inc.: *See*—
Roche, David E. 231,763.
Roche, David E. 231,764.

Fossella, Gregory, to Jet Spray Cooler, Inc. Beverage dispenser. 231,808, 6–11–74, Cl. D94—3.

Foster Grant Co., Inc.: *See*—
Bloch, Jack. 231,799.

Fujishima, Ichiro, to Kabushiki Kaisha Suwa Seikosha. Electric shaver. 231,809, 6–11–74, Cl. D05—3.

Gary, Timothy F.: *See*—
Bernard, James K., Gary, and Cholakis. 231,770.

Gary, Timothy F., and J. Cholakis, to International Playtex Corp. Milk case. 231,771, 6–11–74, Cl. D9—177.

Gary, Timothy F., R. C. Hunter, and H. F. Williams, to International Playtex Corp. Milk case. 231,772, 6–11–74, Cl. D9—177.

Glasbrenner, Louis K. Freeway commercial center. 231,777, 6–11–74, Cl. D13—1.

Glasbrenner, Louis K. Freeway commercial center. 231,778, 6–11–74, Cl. D13—1.

Golay, Gilbert, to Tousdiamants S.A. Jewelry stone. 231,793, 6–11–74. Cl. D45—1.

Golzer, Siegbert, to Mauser Kommanditgesellschaft. Chair. 231,757, 6–11–74, Cl. D6—56.

Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Cigarette lighter. 231,794, 6–11–74, Cl. D48—27.

Guy-Chart Tools Ltd.: *See*—
Chartier, Guy N. 231,768.

Hallock, Edward C., to Construction Specialties, Inc. End piece for handrail. 231,780, 6–11–74, Cl. D13—7.

Hauser, Stephen G.: *See*—
Seitz, Lamont J., and Hauser. 231,781.

Hess, Ernst P. to Xerox Corp. Ribbon cartridge. 231,800, 6–11–74, Cl. D64—11.

Hoey, Fred A., to C. Bruno & Son, Inc. Tambourine or similar article. 231,797, 6–11–74, Cl. D56—1.

Huddy, Robert A. Inhalation mask. 231,803, 6–11–74, Cl. D83—1.

Hunter, Richard C.: *See*—
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Hurkmans, Antoon M.: *See*—
Power, John J. Hurkmans, and Barrett. 231,767.
Imperial Landscape & Supply Co., Inc.: *See*—
Rynberk, Robert W. 231,792.
IMS Corp.: *See*—
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Rosselli, Alberto. 231,759.
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Bernard, James K., Gary, and Cholakis. 231,770.
Gary, Timothy F., and Cholakis. 231,771.
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Invacare Corp.: *See*—
Pivacek, William J. 231,801.
Isabell, Walter J.: *See*—
Kramb, Kenneth D., and Isabell. 231,776.
Jet Spray Cooler, Inc.: *See*—
Fossella, Gregory. 231,808.
K.I.C. Inc.: *See*—
Kramb, Kenneth D., and Isabell. 231,776.
Kabushiki Kaisha Suwa Seikosha: *See*—
Fujishima, Ichiro. 231,809.
Kannemeyer, James C. Opener for a screw top type bottle or the like. 231,766, 6–11–74, Cl. D8—40.
Kean, George W. Lifter for fowl or the like. 231,765, 6–11–74, Cl. D7—103.
Kiddie Products, Inc.: *See*—
Sidman, Ronald J. 231,791.
Kirkpatrick, Hazelle J. Combined comb, sheath therefor. 231,806, 6–11–74, Cl. D86—8.
Kramb, Kenneth D., and W. J. Isabell, to K.I.C. Inc. Vehicular safety device. 231,776, 6–11–74, Cl. D12—199.
Mansei Kogyo Kabushiki Kaisha: *See*—
Goto, Kenjiro. 231,794.
Mascia Carmen T., to Continental Can Co., Inc. Can or similar article. 231,773, 6–11–74, Cl. D9—216.
Matsushita Electric Industrial Co., Ltd.: *See*—
Takahashi, Hanji. 231,798.
Mauser Kommanditgesellschaft: *See*—
Golzer, Siegbert. 231,757.
McLaughlin, James H., to Center for New Product Development. Combined dispenser and closure cap for a pressurized can. 231,774, 6–11–74, Cl. D9—258.
McNair, Samuel L., to Dazey Products Co. Electric foot massager. 231,802, 6–11–74, Cl. D83—1.
McNair, Samuel L., to Dazey Products Co. Electric foot massager. 231,804, 6–11–74, Cl. D83—1.
Micro-Gen Equipment Corp.: *See*—
Thompson, John C. 231,785.
Miller, Susan: *See*—
Berry, Lois B., and Miller. 231,807.
Molzen, Charles F., to Rubbermaid Sales Corp. Rack for bags and wrapping materials. 231,760, 6–11–74, Cl. D6—136.
Montague, Florence R. Trailer. 231,775, 6–11–74, Cl. D12—103.
Morehouse, John B.: *See*—
Morehouse, John H., and J. B. 231,783.
Morehouse, John H., and J. B. 231,784.
Morehouse, John H., and J. B. Hand carried sprayer. 231,783, 6–11–74, Cl. D23—18.
Morehouse, John H., and J. B. Portable sprayer. 231,784, 6–11–74, Cl. D23—18.
Ozeki, Yukii, and Y. Tabata, to Voltek, Inc. and Sekisui Chemical Co. Ltd. Interlocking cushion tiles. 231,789, 6–11–74, Cl. D34—15.
Peoria Journal Star, Inc., The: *See*—
Schwarz, Walter K., and Schlink. 231,796.
Peterson, John C. Marble game puzzle. 231,788, 6–11–74, Cl. D34—15.
Pivacek, William J., to Invacare Corp. Caster support for wheelchairs or the like. 231,801, 6–11–74, Cl. D83—1.
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70	3,815,586
77	3,815,587
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142	3,815,591
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90	3,815,620
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142	3,815,623
318	3,815,624
376	3,815,625
432	3,815,626
486	3,815,627
494	3,815,628
527.8	3,815,629
594	3,815,630
596	3,815,631
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159	3,816,190
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52R	3,815,650
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187	3,815,651
356	3,815,652
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8	3,816,196
	3,816,197
16	3,816,198
71	3,816,199
93	3,816,200
106	3,816,201
117	Re.28,043
123	3,816,202
157	3,816,203
167	3,816,204
178	3,816,205
218	3,816,206
238	3,816,207
245	3,816,208
251	3,816,209
290	3,816,210
309	3,816,211
331	3,816,212
344	3,816,213
345	3,816,214
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394	3,816,217
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486	3,816,220
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1.26	3,815,654
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48	3,816,226
49	3,816,227
63	3,816,228
67	3,816,229
89	3,816,230
141	3,816,231
146	3,816,232
159	3,816,233
160	3,816,234
175	3,816,235
188	3,816,236
227	3,816,237
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15	3,816,239
31	3,816,240
157R	3,816,242
198	3,816,241
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35	3,815,658
65	3,815,659
112	3,815,660
134	3,815,661
203	3,815,662
321	3,815,663
339	3,815,664
359	3,815,665
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1	3,815,666
2	3,815,667
26	3,815,668
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47	3,815,671
55	3,815,670
151	3,815,672
CLASS 166	
.5	3,815,673
57	3,815,674
72	3,815,675
226	3,815,676
253	3,815,677
272	3,815,678
275	3,815,679
281	3,815,680
	3,815,681
	3,815,682
CLASS 169	
37	3,815,821
CLASS 172	
677	3,815,683
694	3,815,684
711	3,815,685
783	3,815,686
789	3,815,688
801	3,815,687
CLASS 173	
27	3,815,689
44	3,815,690
CLASS 174	
51	3,816,638
73R	3,816,639
	3,816,640
76	3,816,641
107	3,816,643
115	3,816,644
138F	3,816,642
CLASS 175	
56	3,815,691
65	3,815,692
232	3,815,693
289	3,815,694
CLASS 176	
60	3,816,244
61	3,816,245
65	3,816,246
78	3,816,247
81	3,816,248
CLASS 177	
15	3,816,156
178	Re.28,040
261	3,815,695
CLASS 178	
2R	3,816,645
5.4CD	3,816,243
6	3,816,646
6.8	3,816,647
	3,816,648
	3,816,649
	3,816,650
7.2	3,816,651
	3,816,654
7.6	3,816,652
	3,816,659
7.88	3,816,655
7.9	3,816,653
34	3,816,656
67	3,816,657
69.5TV	3,816,658
CLASS 179	
1SA	3,816,660
1D	3,816,661
2TV	3,816,662
7MM	3,816,663
15BS	3,816,666
15.55T	3,816,664
18AD	3,816,665
18EA	3,816,668
18GE	3,816,667
84R	3,816,669
99	3,816,670
111E	3,816,671
115.5R	3,816,672
170R	3,816,673
175.2R	3,816,674
CLASS 180	
5R	3,815,696
6.2	3,815,697
6.48	3,815,698
6.66	Re.28,039
11	3,815,699
68P	3,815,700
69C	3,815,701
69.1	3,815,702
91	3,815,703
CLASS 181	
36A	3,815,705
143	3,815,706
199	3,815,707
CLASS 182	
129	3,815,708
CLASS 184	
6.28	3,815,709
CLASS 187	
29R	3,815,710
	3,815,711
	3,815,712
CLASS 191	
49	3,816,675
CLASS 192	
13A	3,815,713
70.25	3,815,714
98	3,815,715
111A	3,815,716
CLASS 194	
1N	3,815,717
	3,815,718
4G	3,815,719
15	3,815,720
40	3,815,721
CLASS 195	
1.8	3,816,249
28N	3,816,251
28R	3,816,250
	3,816,252
29	3,816,253
	3,816,254
30	3,816,255
	3,816,256
36R	3,816,257
47	3,816,258
62	3,816,259
	3,816,260
96	3,816,261
100	3,816,262
103.5R	3,816,263
139	3,816,264
CLASS 197	
127R	3,815,722
CLASS 198	
33AA	3,815,729
33R	3,815,731
38	3,815,723
192R	3,815,724
195	3,815,725
219	3,815,726
230	3,815,727
	3,815,728
287	3,815,730
CLASS 200	
1R	3,816,676
42T	3,816,677
44	3,816,678
51.09	3,816,679
61.51	3,816,680
67DB	3,816,681
83S	3,816,685
148A	3,816,684
148B	3,816,682
	3,816,683
300	3,816,686
CLASS 203	
8	3,816,267
9	3,816,265
11	3,816,266
38	3,816,268
CLASS 204	
1T	3,816,269
15	3,816,270
51	3,816,271
129.1	3,816,272
129.9	3,816,273
149	3,816,274
	3,816,275
152	3,816,276
158R	3,816,277
159.11	3,816,278
	3,816,279
	3,816,280
	3,816,281
159.13	3,816,282
159.15	3,816,283
159.17	3,816,284
162XN	3,816,285
163R	3,816,286
	3,816,287
164	3,816,288
181	3,816,289
218	3,816,290
224M	3,816,291
225	3,816,292
290R	3,816,293
CLASS 206	
163	3,815,732
322	3,815,733
443	3,815,734
485	3,815,735
CLASS 208	
61	3,816,294
86	3,816,295
111	3,816,296
	3,816,297
112	3,816,298
139	3,816,300
143	3,816,299
208R	3,816,301
323	3,816,302
501	3,815,736
CLASS 209	
44	3,815,737
82	3,815,738
170	3,815,739
264	3,815,740
319	3,815,741
CLASS 210	
23	3,816,303
36	3,816,304
42	3,816,305
49	3,816,306
83	3,815,742
94	3,815,743
	3,815,744
96	3,815,745
134	3,815,746
140	3,815,747
163	3,815,748
	3,815,749
202	3,815,750
242	3,815,751
266	3,815,752
284	3,815,753
445	3,815,754
CLASS 211	
41	3,815,755
57	3,815,756
60R	3,815,757
74	3,815,758
CLASS 212	
8A	3,815,759
55	3,815,760
CLASS 214	
1CM	3,815,761
8.5A	3,815,762
16R	3,815,763
82	3,815,764
	3,815,765
138R	3,815,766
383	3,815,767
390	3,815,768
CLASS 215	
1C	3,815,865
228	3,815,769
253	3,815,770
CLASS 217	
3BC	3,815,772
CLASS 219	
10.49	3,816,687
10.55	3,816,688
	3,816,689
10.77	3,816,690
69C	3,816,692
69E	3,816,691
	3,816,693
73	3,816,694
100	3,816,695
107	3,816,697
121EB	3,816,698
	3,816,699
121L	3,816,700
124	3,816,696
152	3,816,701
413	3,816,702
440	3,816,703
462	3,816,704
521	3,816,705
537	3,816,706
CLASS 220	
3	3,815,773
24GC	3,815,774
26R	3,815,775
39R	3,815,776
46R	3,815,777
65	3,815,778
89A	3,815,779
CLASS 221	
15	3,815,780
75	3,815,781
160	3,815,782
CLASS 222	
5	3,815,783
26	3,815,784
46	3,815,785
70	3,815,786
95	3,815,787
146HE	3,815,788
190	3,815,789
309	3,815,790
326	3,815,791
373	3,815,792
399	3,815,793
491	3,815,794
CLASS 223	
70	3,815,795
82	3,815,796
88	3,815,797
102	3,815,798
CLASS 224	
42.42A	3,815,799
45N	3,815,800
CLASS 225	
47	3,815,801
93	3,815,802
CLASS 226	
58	3,815,803
199	3,815,804

CLASS 227
119 3,815,805

CLASS 228
19 3,815,806
29 3,815,807

CLASS 229
15 3,815,808
37E 3,815,809
62 3,815,810

CLASS 232
35 3,815,811

CLASS 235
61.11A 3,816,711
61.11C 3,816,707
3,816,710
61.11H 3,816,708
3,816,709
92MP 3,816,712
92MT 3,816,713
92PD 3,815,812
94R 3,816,714
150.1 3,816,715
150.2 3,816,716
150.21 3,816,717
150.26 3,816,718
151 3,816,719
151.1 3,816,724
151.11 3,816,723
151.12 3,816,720
151.13 3,816,721
152 3,816,722
3,816,725
3,816,726
153AS 3,816,727
153BD 3,816,728
156 3,816,729
3,816,730
3,816,731
3,816,732
164 3,816,733
168 3,816,734
181 3,816,735
186 3,816,736
192 3,816,737

CLASS 236
23 3,815,813
44R 3,815,814
78 3,815,815

CLASS 238
10R 3,815,817
228 3,815,818

CLASS 239
11 3,815,819
15 3,815,820
56 3,815,828
102 3,815,829
125 3,815,822
163 3,815,830
498 3,815,831
563 3,815,832
650 3,815,823
674 3,815,824
683 3,815,825

CLASS 240
2.18 3,816,738
3 Re.28,041
10R 3,816,739
26 3,816,740

CLASS 241
1 3,815,826
5 3,815,833
28 3,815,834
46R 3,815,827
188A 3,815,835

CLASS 242
27.4 3,815,841
46.4 3,815,836
54R 3,815,837
71.2 3,815,838
72 3,815,839
3,815,840
96 3,815,842
3,815,843
128 3,815,844
129 3,815,845
158R 3,815,846
191 3,815,847

CLASS 244
1SS 3,815,849
1N 3,815,848
77A 3,815,850

CLASS 248
24 3,815,852
44 3,815,853
47 3,815,854
74B 3,815,855
118 3,815,856
223 3,815,857
295 3,815,858
300 3,815,859
464 3,815,860

CLASS 249
19 3,815,861
40 3,815,862
121 3,815,851
178 3,815,863
179 3,815,864

CLASS 250
213VT 3,816,744
221 3,816,745
223R 3,816,746
276 3,816,747
296 3,816,748
324 3,816,749
338 3,816,750
347 3,816,741
364C 3,816,743
499 3,816,742

CLASS 251
25 3,815,866
61.3 3,815,867
86 3,815,868
306 3,815,869
309 3,815,870
310 3,815,871
323 3,815,872
337 3,815,873

CLASS 252
8.1 3,816,307
8.5A 3,816,308
12 3,816,309
32.5 3,816,346
32.7HC 3,816,310
46.7 3,816,311
48.2 3,816,312
49.6 3,816,313
51.5A 3,816,314
3,816,315
72 3,816,316
79.5 3,816,317
89 3,816,318
95 3,816,319
99 3,816,320
134 3,816,321
147 3,816,322
182 3,816,323
186 3,816,324
188.3CL 3,816,325
3,816,326
301.6P 3,816,327
301.6S 3,816,328
312 3,816,329
313S 3,816,330
316 3,816,331
373 3,816,332
389A 3,815,333
389.001 3,816,333
408 3,816,334
3,816,335
3,816,336
414 3,816,337
420 3,816,338
426 3,816,339
430 3,816,340
438 3,816,341
445Z 3,816,342
455R 3,816,343
3,816,344
478 3,816,345
511 3,816,347
520 3,816,348
522 3,816,349
3,816,350
527 3,816,351
556 3,816,352
558 3,816,353
3,816,354

CLASS 254
29A 3,815,874
132 3,815,875

CLASS 256
22 3,815,876
24 3,815,877

CLASS 259
37 3,815,878

CLASS 260
2.1E 3,816,355
2.2C 3,816,356
2.2R 3,816,357
2.5AM 3,816,360
2.5S 3,816,359
3 3,816,361
4R 3,816,358
17A 3,816,362
3,816,363
18EP 3,816,364
22D 3,816,365
23EP 3,816,366
29.6R 3,816,367
30.2 3,816,442
31.8XA 3,816,560
47UA 3,816,374
47XA 3,816,373
47C 3,816,368
67FA 3,816,375
69R 3,816,376
75M 3,816,377
75N 3,816,378
75R 3,816,486
78R 3,816,369
79.3MU 3,816,370
79.5C 3,816,371
80.7R 3,816,379
82.1 3,816,380
88.2D 3,816,381
93.1 3,816,382
94.3 3,816,567
94.9F 3,816,383
112.5 3,816,385
3,816,386
3,816,387
123.5 3,816,389
152 3,816,388
157 3,816,392
158 3,816,390
3,816,391
209R 3,816,393
3,816,394
210E 3,816,397
3,816,398
210R 3,816,395
3,816,396
210.5 3,816,403
211.5R 3,816,399
3,816,400
225 3,816,402
239BA 3,816,407
239A 3,816,408
239.1 3,816,411
239.3A 3,816,404
3,816,410
239.3B 3,816,409
239.5 3,816,405
3,816,406
3,816,412
240J 3,816,414
240 3,816,413
247.7E 3,816,415
248CS 3,816,416
3,816,417
3,816,418
249.9 3,816,419
256.4F 3,816,421
3,816,422
256.4N 3,816,423
256.5R 3,816,420
3,816,424
268CN 3,816,425
268C 3,816,426
279R 3,816,428
288R 3,816,429
289QP 3,816,431
290V 3,816,432
293.8 3,816,433
3,816,434
294.8B 3,816,437
3,816,438
294.8F 3,816,435
3,816,436
294.9 3,816,439
295R 3,816,440
302SD 3,816,441
304 3,816,443
306.7 3,816,444
3,816,445
307F 3,816,446
310C 3,816,447
325 3,816,448
3,816,449
326A 3,816,450
326.13R 3,816,453
326.15 3,816,454
326.28 3,816,455
326.5FM 3,816,451
326.61 3,816,452
327TH 3,816,456
327B 3,816,466
329AM 3,816,457
340.9 3,816,458
3,816,459
343.3 3,816,460
3,816,461
3,816,462
3,816,463
343.6 3,816,464
345.1 3,816,465
345.2 3,816,470
345.7 3,816,467
345.9 3,816,468
346 3,815,771
346.002 3,816,474
346.02G 3,816,471
346.02R 3,816,473
346.2R 3,816,469
346.8 3,816,472
3,816,475
347.5 3,816,476
348R 3,816,477
3,816,478
348.5L 3,816,479
397.1 3,816,480
397.4 3,816,481
397.7R 3,816,482
404 3,816,483
3,816,484
410.9R 3,816,485
412.8 3,816,487
413 3,816,488
448.8R 3,816,489
453AL 3,816,490
453SP 3,816,491
453P 3,816,499
453R 3,816,498
454 3,816,497
455A 3,816,500
3,816,502
455R 3,816,501
464 3,816,503
465G 3,816,504
3,816,505
465.3 3,816,506
468D 3,816,508
468R 3,816,507
469 3,816,509
482R 3,816,510
484A 3,816,511
485H 3,816,512
488CD 3,816,514
488K 3,816,513
497A 3,816,515
501.17 3,816,516
502.21 3,816,519
502.5 3,816,517
3,816,518
512R 3,816,520
521R 3,816,521
523A 3,816,522
524R 3,816,523
527R 3,816,524
531R 3,816,525
544M 3,816,526
552R 3,816,527
555A 3,816,528
558A 3,816,529
564F 3,816,530
3,816,531
566AC 3,816,532
567.6M 3,816,533
570.7 3,816,430
586R 3,816,535
3,816,536
3,816,537
586 3,816,534
590 3,816,538
606 3,816,539
610B 3,816,540
613D 3,816,541
3,816,542
619A 3,816,544
619D 3,816,543
621G 3,816,545
621R 3,816,546
624R 3,816,547
632C 3,816,548
637R 3,816,549
641 3,816,550
646 3,816,551
648F 3,816,552
3,816,553
659A 3,816,554
677R 3,816,384
683.15R 3,816,555
836 3,816,556
837 3,816,557
838 3,816,558
857 3,816,559
871 3,816,561
874 3,816,562
876R 3,816,563
878R 3,816,564
884 3,816,565
898 3,816,566
944 3,816,568
961 3,816,569
968 3,816,570

CLASS 261
93 3,815,879
114VT 3,815,880

CLASS 264
1 3,816,571
28 3,816,572
45 3,816,573
3,816,574
49 3,816,575
56 3,816,576
97 3,816,579
3,816,580
98 3,816,578
233 3,816,581
255 3,816,582
282 3,816,583
289 3,816,584
297 3,816,585
332 3,816,586

CLASS 266
5F 3,815,881
19 3,815,882
23K 3,815,884
23T 3,815,883

CLASS 267
65B 3,815,885
91 3,815,887
180 3,815,886

CLASS 269
2 3,815,888
28 3,815,889
43 3,815,890
45 3,815,891
75 3,815,892
98 3,815,893
167 3,815,894

CLASS 270
56 3,815,895

CLASS 271
4 3,815,896
9 3,815,897
65 3,815,898
80 3,815,899
118 3,815,900

CLASS 272
3 3,815,901
59C 3,815,902
81 3,815,903
82 3,815,904

CLASS 273
25 3,815,905
26R 3,815,906
30 3,815,907
54B 3,815,908
54C 3,815,909
80C 3,815,910
86C 3,815,911
86F 3,815,912
101.2 3,815,913
102S 3,815,914
104 3,815,915
106.5C 3,815,916
110 3,815,917
130R 3,815,918
134AD 3,815,919
157R 3,815,920
174 3,815,921
184B 3,815,922
186R 3,815,923

CLASS 274
23R 3,815,924

CLASS 277
2 3,815,925
34 3,815,926
180 3,815,927

CLASS 279
1B 3,815,928
4 3,815,929
50 3,815,930

CLASS 280
1.21 3,815,931
33.99F 3,815,932
47.35 3,815,933
150AB 3,815,935
150SB 3,815,934
415A 3,815,936
434 3,815,937
461R 3,815,938
474 3,815,939

CLASS 285
105 3,815,940
283 3,815,941

CLASS 290
2 3,816,751

CLASS 292
113 3,815,942
254 3,815,943
261 3,815,944
340 3,815,945

CLASS 293
99 3,815,946

CLASS 294
87.2 3,815,947

CLASS 296
1S 3,815,948
23C 3,815,949
56 3,815,950
137F 3,815,951

CLASS 297
47 3,815,952
195 Re.28,038
3,815,953
271 3,815,954
295 3,815,955
349 3,815,956

CLASS 299
5 3,815,957

CLASS 301
41R 3,815,958
63PW 3,815,959

CLASS 303
52 3,815,961

CLASS 305
14 3,815,960
19 3,815,962

CLASS 307
66 3,816,752
88.3 3,816,753
3,816,754
115 3,816,755
141 3,816,757
149 3,816,756
214 3,816,758
225 3,816,759
235R 3,816,760
3,816,761
237 3,816,762
252UA 3,816,763
260 3,816,764
3,816,765
278 3,816,766
288 3,816,767
296 3,816,768
304 3,816,769
308 3,816,770

CLASS 308
10 3,815,963
78 3,815,964

CLASS 310
5 3,816,771
6 3,816,772
8.1 3,816,773
8.6 3,816,774
9.6 3,816,775
13 3,816,776
3,816,777
25 3,816,778
37 3,816,779
52 3,816,780
68R 3,816,781
90 3,816,782
246 3,816,783

CLASS 312
100 3,815,965
250 3,815,966
327 3,815,967

CLASS 313
32 3,816,784
61S 3,816,785
94 3,816,787
174 3,816,788
243 3,816,789
299 3,816,790
400 3,816,786

CLASS 315
18 3,816,791
27TD 3,816,792
29 3,816,793
194 3,816,794
246 3,816,795
287 3,816,796
291 3,816,797
330 3,816,798

CLASS 317
2R 3,816,799
12A 3,816,800
14G 3,816,801
16 3,816,802

CLASS 320
1 3,816,803
9 3,816,804
15 3,816,805
20 3,816,806
3,816,807

CLASS 321
14 3,816,809
19 3,816,810
61 3,816,808

CLASS 324
61R 3,816,811
62 3,816,812
73R 3,816,813
83A 3,816,814
112 3,816,815
133 3,816,816

CLASS 337
331 3,815,816

CLASS 339
97P 3,816,817
99R 3,816,818
3,816,819
198R 3,816,821
263R 3,816,820

CLASS 340
15.5R 3,815,704
324AD 3,816,823

	3,816,824
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	49	231,767
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DESIGN PATENTS

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PLANT PATENTS

6 : 3,568

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41 : 3,567

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Frederick B. Dent, *Secretary*

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